Natural Resources Management Program

AN ADDENDUM
TO THE NATURAL
RESOURCE MANAGEMENT PLAN
FOR

Sequoia & Kings Canyon National Parks / California

JUNE 1981 Revision

Prepared by
SEQUOIA & KINGS CANYON NATIONAL PARKS

NATIONAL PARK SERVICE / U.S. DEPARTMENT OF THE INTERIOR

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NATURAL RESOURCES MANAGEMENT PROGRAM

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NATURAL RESOURCES MANAGEMENT PLAN

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SEQUOIA AND KINGS CANYON NATIONAL PARKS

JUNE 1981 REVISION

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Sequoia and Kings Canyon National Parks
National Park Service
Department of the Interior

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NATURAL RESOURCES MANAGEMENT PROGRAM

ABSTRACT

This 1981 revision of the Management Program (MP), an addendum to the 1981 revision of the Natural Resources Management Plan (NRMP) for Sequoia and Kings Canyon National Parks, proposes an expanded program. Also, this revision summarizes present status and identifies progress of projects proposed in the original NRMP and Environmental Assessment dated November 1976.

Several new projects, representing minor changes from the 1976 MP, are scheduled to be carried out in the parks. Each new project is outlined in a Project Statement that serves as a blueprint for action but Project Statements are not included for all projects listed herein. All Project Statement titles are listed in priority order along with a summary of costs required to carry them out in a revised Natural Resources Projects Programming Sheet. A five-year planning strategy for natural resources management, monitoring and research are presented in a section entitled Overview and Needs.

This Management Program will be reviewed annually, updated and revised as work is completed and new projects are proposed. Scheduling of projects will depend on availability of funds and overall priorities in the Parks.

OVERVIEW AND NEEDS

The natural resources of Sequoia and Kings Canyon National Parks are outstanding examples of the central and southern Sierran ecosystems. The primary resources which undoubtedly brought about National Park status were wilderness and the forest vegetation, especially sequoia forests. These resources were cited in Acts establishing the area as Parks - the wisdom and rationale were sound. All of the Parks' resources are like building blocks, and the logical capstone is wilderness, pure and simple, many ecological factors working within a natural system unaltered by man. The sequoia forests are literally a wonder of the world, and nowhere do they exist as in the magnificent groves in the Parks.

The natural resources of the Parks are increasingly being threatened by air and water pollution from inside and outside the Parks. Wildfire, and man's use of the Parks are also impacts. Acid precipitation and ozone will impact the Parks' resources well into the future. These threats alter the natural processes and ecological relationships. Unless the trends are mitigated or reversed, we will not be able to "restore and/or maintain the natural ecosystems of these Parks so they may operate essentially unimpaired by human interference" and preserve the Parks for future generations.

Major aspects of natural resources management include:

1. Vegetation Management
2. Fire Management
3. Restoration of the Sequoia Ecosystem
4. Wilderness Management (mitigation of man's impact)
5. Cave Management
6. Air and Water Quality Monitoring and Evaluation
7. Aquatic and Wildlife Management

This plan presents a five year strategy of resources management monitoring, and research to solve the significant resource problems. The highest priority problems include mitigation of the wildfire threat by reintroducing fire as a natural process, man's threat to aquatic, wildlife, and vegetation resources, and air and water pollution. The resource problem ranking factors were used to determine the highest priorities. Other resource problems are listed in the Natural Resources Programming Sheet.

Wildfire, a Threat to Natural Resources

The existing fire management program consists of fire presuppression, prevention and suppression, allowing natural fires to burn, prescribed burning, and monitoring the effects of fires. A research project of $32,000 to study fire ecology of chamise and other chaparral species is also being conducted.

The Fire Management and Visitor Protection, Resources Management, and Interpretive Divisions provide a varying amount of support to the program. A total of four permanent and 20 temporary employees are engaged in fire management activities full time. The majority of the program is concerned with fire suppression. The small number of people involved in the Fire Management Organization results in barely enough personnel for minimal fire protection; prescribed burning can usually only be done when other divisions provide personnel.

The proposed increase for fire management will be for fire protection, prescribed burning, and monitoring of all fires. The additional temporary Park Technicians will provide sufficient personnel to lend the fire management program the flexibility it needs to deal with the wildfire threat. An increased level of monitoring by two Park Technicians will assure the objectives are being met. The increase in personnel will allow the fire management program to reach the operational level specified in the Fire Management Plan. This should include a gradual increase in the number of acres prescribed burned from the 2,500-3,500 acres now being burned annually to approximately 12,000 acres annually within five years.

Background research studies will be conducted to understand the role of fire in the foothill woodland and mixed evergreen communities as well as the non-sequoia upper mixed conifer and sub-alpine forest types, and rare, threatened and endangered plant species.

Management of Vegetation in Developed and Backcountry Areas to Reduce Man's Impact

The existing vegetation management program includes detection and removal of insect and diseased and hazardous trees, restoration of fragile mountain meadow resources, and planning and monitoring of the above programs. Staffing consists of a Forestry/Backcountry Crew of one permanent Forestry Foreman and two Forestry Leader/workers and one temporary employee and two Forestry Technicians that perform all planning and monitoring. Removal of only the most hazardous trees, restoration of one trail from a meadow and monitoring of these projects is being accomplished annually. Research to develop wilderness carrying capacities and to determine methods to assess damage by visitor use to campsites is also under way.

The proposed increases for the vegetation management program would concentrate on mitigating man's impact on vegetation of the Parks; this would include management of vegetation in developed areas and expanding the vegetation restoration program in the wilderness to disturbed camp areas.

The existing vegetation management program would be brought to a fully operational level. Continuity, that has not heretofore existed, would be provided to the program. This would include a vegetation staff and support cost. A research project for three years will be conducted to determine the nature, history and management needs for preserving meadows, threatened and endangered plants and other unique ecosystems, and for rehabilitating heavily impacted wilderness areas.

Mitigation of Bear/Human Interaction

The existing bear management program consists of a professional Fish and Wildlife Specialist, Biological Technician (LTFT), and one temporary Park Technician. These personnel are responsible for wildlife and bear management, fisheries management, and monitoring water quality, and the effects of fire on animal populations. Bear management alone should be a full time job for several people during the summer. Property damage and the number of bear incidents have increased by 51 percent over 1979. The impact of man on bears must be mitigated if we are to preserve this unique species.

The proposed increase for bear management and monitoring program will consist of seven additional temporary Park Technicians/Aids in four areas in the Parks that experience severe bear and other wildlife problems. A program to monitor fish and wildlife resources and the impacts of man on them will be instituted to determine the feasability of reintroducing bighorn sheep to former ranges and to assess the impact of man on threatened and endangered wildlife species. The ongoing bear research program will be completed in FY83 and should provide us with valuable information on bear population dynamics.

Air and Water Pollution

At present, the air and water quality monitoring program is performed by the Environmental Specialist and Fish and Wildlife Specialist. There are no base funds for air quality equipment and the water quality monitoring equipment was purchased with emergency funds during a fish kill. Temporary help is expected to continue to be rare. Only acid precipitation is monitored regularly; water quality is tested in conjunction with fish kills, but no baseline data is being taken. Trends and deterioration will be difficult to prove legally.

The proposed air and water quality monitoring program requests a team of five technicians -- an Air Quality Specialist to oversee the operation and ensure continuity of quality in data collection; and four temporary Park Technicians to monitor air and water quality and maintain equipment. While trained primarily in either air or water quality monitoring, they will form a team for the general monitoring of the Parks' air and water. No resource management activities are anticipated at this time. A three year research project will be conducted to establish baseline data and monitoring techniques of the impact of acid rain on aquatic ecosystems.

Anticipated Accomplishments by Fiscal Year

FY-82 - The newly funded air and water quality program will involve a constant monitoring of these Parks' air and water quality throughout the year. Baseline data and trends will be collected, and any significant deterioration and threat to resource integrity and visitor safety will be noted and will be the instigation of correction measures. The Fire, Vegetation, and Fish and Wildlife Management programs will continue at the same level as in FY-81.

Ongoing research carried over from FY-81 includes chaparral fire ecology and black bear studies. Developing backcountry carrying capacities will be an important project. New research will include a study to determine the status of the peregrine falcon, condor, and bald eagle and fire ecology of foothill woodland communities.

FY-83 - Air and water quality monitoring, vegetation management, and fish and wildlife management will continue at the same level as in FY-82. The fire management program would be expanded by $132,000 if funding is available. Some 9000 acres of mixed-conifer and chamise will be prescribed burned, and all prescribed burns and prescribed natural fires monitored.

Research projects ongoing in FY-82 will continue through FY-83. The black bear ecology project will be completed and a report sent to management. The fully operational level for the bear management program is expected in FY-84. New research projects will study the effects of fire on threatened and/or endangered plants and will develop techniques for restoring mountain meadows.

FY-84 - Air and water quality monitoring and fire management will continue at about the same level as FY-83. The bear management program will be expanded significantly. The research on black bear ecology should provide significant data on solving the bear problem. A Plan to manage vegetation in developed areas will be implemented with the newly funded vegetation management program. An expanded fisheries management program will also be started.

The research program will develop prescriptions for foothill woodland and mixed evergreen communities and conduct research burns. A new four-year project to evaluate the impacts of management and external influences on the Parks' ecosystems will also be started. Research will start on developing techniques to preserve mountain meadows, study the possibility of reintroducing bighorn sheep, and assess deer population trends.

FY-85 - The monitoring of air will continue at the same level as in FY-84. An increased program in analyzing water quality to establish a baseline will be started. Some 11,200 acres of mixed-conifer and chaparral will be prescribed burned and monitored. New programs to monitor threatened and endangered animals and to correct man's impacts on the wilderness will be started.

New research projects include studying the effects of fire on fauna and the ecology of exotic plants.

FY-86 - Existing resource management programs will be conducted at the same level as FY-85. New programs will include restoring the General Sherman tree area to more natural conditions and developing a plan to reintroduce bighorn sheep if research shows it is feasible. The beaver population in the Kern River will be surveyed and plans prepared to control them, if feasible.

No new research projects will start. All projects listed previously will still be ongoing.

NATURAL RESOURCES PROJECTS PROGRAMMING SHEET

June 1981

Sequoia and Kings Canyon National Parks

NPS Costs Expressed in $1000

Inc. No.	Park Priority	Ref. No.	Project Title	FY82 Base	FY82 New	FY83 Base	FY83 New	FY84 Base	FY84 New	FY85 Base	FY85 New	FY86 Base	FY86 New
	1	RM-1	Resource Mgmt. Administration and Supervision	61.2		61.2		61.2		61.2		61.2	
	2	N-1	Base for Research program	67.2		67.2		67.2		67.2		67.2	
	3	RM-7	Prescribed fire Management	50.1		50.1		50.1		50.1		50.1	
	4	RM-26	Wildland fire protection	250.5		250.5		250.5		250.5		250.5	
	5	RM-3	Hazard tree removal & vegetation monitoring	100.0		100.0		100.0		100.0		100.0	
	6	RM-8	Bear Mgmt.	23.3		23.3		23.3		23.3		23.3	
	7	N-2	Black Bear Ecology	57.0		57.0							
	8	N-6	Chaparral Fire Ecology	10.0		10.0		10.0		10.0		10.0	
	9	RM-27	Fish & Wildlife Management	28.5		28.5		28.5		28.5		28.5	
	10	RM-29	Air & Water Quality Monitoring	87.2		87.2		87.2		87.2		87.2	

NATURAL RESOURCES PROJECTS PROGRAMMING SHEET

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Sequoia and Kings Canyon National Parks

NPS Costs Expressed in $1000

Inc. No.	Park Priority	Ref. No.	Project Title	FY82 Base	FY82 New	FY83 Base	FY83 New	FY84 Base	FY84 New	FY85 Base	FY85 New	FY86 Base	FY86 New
	11	N-3	Wilderness Impact Studies	17.0		17.0		12.0					
	12	N-4	Kaweah River Diversion	77.5		77.5							
	13	RM-28	Soil & Moisture Conservation	7.6		7.6		7.6		7.6		7.6	
138	14	RM-30	Use of prescribed fire and fire protection to reduce the wildfire threat to resources & safety				132.0		132.0		132.0		132.0
140	15	RM-10	Mgmt. of vegetation in developed areas & backcountry areas to reduce man's impact.						89.7		89.7		89.7
141	16	RM-31	Mitigation of bear/human interactions						92.4		92.4		92.4
	17	N-7	Research on the status of endangered California Condor Peregrine Falcon & Bald Eagle		22.5		20.5						

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Sequoia and Kings Canyon National Parks

June 1981

NPS Costs Expressed in $1000

Inc. No.	Park Priority	Ref. No.	Project Title	FY82 Base	FY82 New	FY83 Base	FY83 New	FY84 Base	FY84 New	FY85 Base	FY85 New	FY86 Base	FY86 New
	18	N-15	Fire Ecology of foothill woodland communities		32.0		32.0		32.0		32.0		32.0
047	19	RM-12	Professional & technical support for vegetation management						66.2		66.2		66.2
	20	N-21	Evaluate impact of management & external influences on Park ecosystem				49.0		49.0		49.0		49.0
085	21	N-13	Fire ecology/ biology of endangered & threatened plants				16.0		16.0		16.0		16.0
	22	N-16	Preservation of Mountain Meadows				20.0		20.0		20.0		20.0
082	23	RM-18	Preserve Mtn. Meadows						41.0		41.0		41.0
029	24	N-11	Management impacts on deer						16.0		16.0		
	25	RM-32	Deer Management and Monitoring						8.9		8.9		8.9

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NPS Costs Expressed in $1000

Inc. No.	Park Priority	Ref. No.	Project Title	FY82 Base	FY82 New	FY83 Base	FY83 New	FY84 Base	FY84 New	FY85 Base	FY85 New	FY86 Base	FY86 New
	26	RM-33	Fisheries Mgmt.						24.2		24.2		24.2
	27	N-18	Techniques for rehabilitating backcountry impacts						19.0		19.0		19.0
	28	RM-34	Support for water quality analysis								46.4		26.4
	29	RM-21	Wilderness use monitoring								20.0		20.0
086	30	RM-22	Monitoring & management of threatened & endangered species								7.1		7.1
	31	N-22	Reintroduction of bighorn sheep						35.0		35.0		35.0
	32	RM-35	Giant sequoia restoration								12.0		12.0
	33	RM-36	Reintroduction of bighorn sheep to the Great Western Divide								74.0		74.0
031	34	RM-11	Exotic Beaver Control								17.3		17.3

NATURAL RESOURCES PROJECTS PROGRAMMING SHEET

June 1981

Sequoia and Kings Canyon National Parks

NPS Costs Expressed in $1000

Inc. No.	Park Priority	Ref. No.	Project Title	FY82 Base	FY82 New	FY83 Base	FY83 New	FY84 Base	FY84 New	FY85 Base	FY85 New	FY86 Base	FY86 New
087	35	RM-23	Staff support for cave mgmt.								33.3		33.3
	36	N-14	Data Storage/ Retrieval System						38.0		38.0		38.0
	37	N-8	Fire dynamics of subalpine forest types						18.0		18.0		18.0
	38	RM-37	Long term monitoring of management impacts on natural communities								67.2		67.2
	39	N-25	Effects of acid rain on vege-tation & aquatic systems										36.0
076	40	N-10	Ecological role of smoke from fire management program						18.0		18.0		18.0
	41	RM-38	Monitor & evaluate ozone injury on vegetation								8.1		8.1
	42	N-19	Effects of fire on fauna				5.0		25.0		25.0		25.0

NATURAL RESOURCES PROJECTS PROGRAMMING SHEET

June 1981

Sequoia and Kings Canyon National Parks

NPS Costs Expressed in $1000

Inc. No.	Park Priority	Ref. No.	Project Title	FY82 Base	FY82 New	FY83 Base	FY83 New	FY84 Base	FY84 New	FY85 Base	FY85 New	FY86 Base	FY86 New
074	43	RM-13	Reestablish vegetation mosaic in campgrounds & developed areas								82.0		82.0
	44	N-26	Ecology of exotic plants										28.0
	45	RM-39	Vista Clearing										23.0
	46	N-23	Inventory of rivers & lakes						15.0		1.5		1.5
089	47	RM-25	Restore abandoned trails & roads to natural conditions								25.1		25.1
053	48	RM-15	Remove abandoned fences								22.3		22.3
056	49	RM-16	Naturalize cut stumps & logs										11.4
083	50	RM-19	Dwarf mistletoe control										19.0

LIST OF NATURAL RESOURCE PROJECTS

Sequoia and Kings Canyon National Parks

The following is a list of continuing and proposed projects. Resource management projects are coded "RM" and natural science projects are coded "N".

Reference No.	Project Title	Status of Project
RM-1	Resources Management administration and supervision	Continuing
RM-3	Hazard tree removal and vegetation monitoring	Continuing
RM-7	Prescribed fire management	Continuing
RM-8	Bear Management	Continuing
RM-10	Management of vegetation in developed and back-country areas to reduce man's impact	Proposed FY-83
RM-11	Exotic beaver control	Proposed FY-85
RM-12	Professional and technical support for vegetation management	Proposed FY-84
RM-13	Reestablish natural vegetation mosaic in campgrounds and developed areas	Proposed FY-85
RM-15	Removal of abandoned fences	Proposed FY-85
RM-16	Naturalize cut stumps and logs	Proposed FY-86
RM-18	Preserve mountain meadows	Proposed FY-84

Reference No.	Project Title	Status of Project
RM-19	Dwarf Mistletoe Control	Proposed FY-86
RM-21	Wilderness Use Monitoring	Proposed FY-85
RM-22	Monitoring and management of threatened and endangered species	Proposed FY-85
RM-23	Staff support for cave management	Proposed FY-85
RM-25	Restore abandoned trails and roads to natural conditions	Proposed FY-85
RM-26	Wildland Fire Protection	Continuing
RM-27	Fish and Wildlife Management	Continuing
RM-28	Soil & Moisture Conservation	Continuing
RM-29	Air & Water Quality Monitoring	Continuing
RM-30	Use of prescribed fire and fire protection to reduce the wildfire threat to resources and safety	Proposed FY-83
RM-31	Mitigation of bear/human interaction	Proposed FY-84
RM-32	Deer management & monitoring	Proposed FY-84
RM-33	Staff support for fisheries management	Proposed FY-84
RM-34	Staff support for water quality analysis	Proposed FY-85
RM-35	Giant Sequoia Restoration	Proposed FY-85
RM-36	Reintroduction of bighorn sheep to the Great Western Divide	Proposed FY-85

Reference No.	Project Title	Status of Project
RM-37	Long term monitoring of management impacts on natural communities	Proposed FY-85
RM-38	Monitor and evaluate ozone injury on vegetation	Continuing ~~Proposed FY-85~~
RM-39	Vista Clearing	Proposed FY-86
N-1	Base for Research Program	Continuing
N-2	Black Bear Ecology	Continuing
N-3	Wilderness Impact Studies	Continuing
N-4	Kaweah River Studies	Continuing
N-6	Chaparral Fire Ecology	Continuing
N-7	Research on the status of the Endangered California Condor, Peregrine Falcon, and Bald Eagle	Proposed FY-82
N-8	Fire dynamics of subalpine forest types	Proposed FY-84
N-10	Ecological role of smoke from fire management program	Proposed FY-84
N-11	Management Impacts on Deer	Proposed FY-84
N-13	Fire ecology/biology of endangered and threatened plants	Proposed FY-83
N-14	Data Storage/Retrieval System	Proposed FY-84
N-15	Fire ecology of foothill woodland communities	Proposed FY-82
N-16	Preservation of Mountain Meadows	Proposed FY-83

Reference No.	Project Title	Status of Project
N-18	Techniques for rehabilitating backcountry impact	Proposed FY-84
N-19	Effects of fire on fauna	Proposed FY-83
N-21	Establishment of baseline data to evaluate impacts of management programs and external influences on Parks ecosystems	Proposed FY-83
N-22	Reintroduce Bighorn Sheep	Proposed FY-84
N-23	Inventory of Rivers & Lakes	Proposed FY-84
N-25	Effects of acid rain on vegetation and aquatic ecosystems	Proposed FY-86
N-26	Ecology of Exotic Plants	Proposed FY-86

NATURAL RESOURCES PROJECT STATEMENT

1. PARK AND REGION: Sequoia and Kings Canyon National Parks; Western Region

2. PROJECT NAME AND NUMBER: Management of Vegetation in Developed and Backcountry Areas to Reduce Man's Impact; RM-10

3. STATEMENT OF PROBLEM: There are 2,392 acres in 10 major developed areas within the Parks. The objective for managing vegetation in these areas is to re-establish and maintain a healthy, safe forest community that approximates "natural" conditions, given the constraints of present and past human intervention. Vegetation ranges from chaparral through ponderosa pine forest, sequoia-mixed conifer forests, to red fir. Fire exclusion has resulted in an increase of over mature trees that are a safety hazard, an over abundance of shade tolerant trees, such as white fir, that compete for moisture with overstory trees, and an increased level of insects and diseases that can reach epidemic proportions.

   Man has also heavily impacted these areas by paving over tree roots, damaging individual trees and by preventing regeneration of trees because of heavy soil compaction. To maintain a safe environment, an average of 200 hazard trees and 100-150 infect diseased trees must be removed annually. Unless these trees are removed, failures can be expected to increase and cause serious property damage to Government or concession facilities and/or personal injury or death to visitors or employees and more trees will be impacted by insect and disease. Since 1970 there have been two fatalities, nine personal injuries and over $50,000 in property damage. Expensive tort claim settlements could come from such failures. Just removing these trees without replacing them will eventually result in all sites being denuded, making them uninhabitable. Funds are needed to develop a total integrated vegetation management program in the Parks' developed areas.

   Man also impacts vegetation in the backcountry. Many popular backcountry camp areas, such as Paradise Valley and Rae Lakes, are severely eroded because of hiking and camping. Actions need to be taken to rehabilitate eroded and denuded areas.

4. WHAT HAS BEEN DONE: There has been a hazard tree removal program since 1969. Some 5,000 hazard trees have been removed from developed areas during this time with more being replaced. A forest pest control program to suppress native bark beetles started in 1918 and has continued in varying degrees to 1979. These programs have only reacted to symptoms of the overall problem of fire exclusion and man's impact.

No formalized program exists for restoration of heavily eroded areas in the backcountry. Guidelines for restoring heavily used camp areas are being prepared.

5. DESCRIPTION OF WORK TO BE UNDERTAKEN: A vegetation Management Plan to implement an integrated vegetation management program is being developed. The plan will be ready for implementation in 1982. Under this program the following will be accomplished:

   a. Native plant species composition will be reestablished and maintained.

   b. Forest insects and diseases will be managed.

   c. Denuded and eroded areas will be revegetated.

   d. Hazardous trees will be removed.

   e. A monitoring program will be developed to assess the effectiveness of the program.

   This program will provide a more "natural," aesthetically pleasing, and safe environment in the Parks' developed areas.

   A program to rehabilitate eroded and denuded backcountry camp areas will be developed. Campsites will be surveyed and prioritized. Techniques developed by research will be used to rehabilitate them.

6. LENGTH OF TIME NEEDED: This is a continuing project.

7. WHAT WILL HAPPEN IF THE PROJECT IS NOT UNDERTAKEN: The present forestry crew of three permanent and subject to furlough employees can only remove hazard trees that are in imminent danger of falling. Without this program there will be an increased level of tree failures that will result in property damage, injury, and possibly death. Tort claims can also be expected to increase. As man's impacts increase, more areas will become denuded and eroded, trees will be under greater stress, and the environment would become aesthetically displeasing. Backcountry camp areas would continue to receive heavy use. As areas are over used, visitors would then shift to new areas, spreading the impact over a much larger area.

8. WHAT ARE THE ALTERNATIVES:

   a. No action - Under this alternative no management would be done. Hazard trees would not be removed and insects and diseases would be allowed

to run their course. This would result in an increased hazard to people and property and an unacceptable loss of trees in developed areas to insects and diseases.

b. Continue the program at the current level. The three career/career conditional employees would only be able to remove the most serious tree hazards. No insect and diseased trees would be removed. Results would be the same as "a".

c. Request Forest Service funds to augment the program. These funds are not to be used for removal of hazard trees. They could be used to conduct surveys of insect infestations and disease conditions of trees and to suppress insect and disease outbreaks. With the uncertainty of these funds each year, continuity of the program would suffer.

d. Develop an integrated vegetation management program with ONPS funds and use Forest Service funds only for uses outlined in the Forestry Assistance Act, PL. 35-313. A program to restore heavily used backcountry camp areas would be developed.

9. PERSONNEL: One subject to furlough Forestry Worker, WG-8, one subject to furlough Sawyer/Woodsworker, WG-5, one Forestry Leader, WG-5, one temporary Tree Worker, WG-6, one temporary Equipment Operator, WG-8, and two temporary Laborers, WG-4 will be added to the Park staff.

10. ADMINISTRATION AND LOGISTICS: This project is under the supervision of the Chief of Resources Management. Form 10-237 submitted March 13, 1981.

FUNDING:

	Year in Program Sequence				
	1st	2nd	3rd	4th	5th
Personal Services			$138,500	$138,500	$138,500
Other than Personal Services			$ 34,600	$ 34,600	$ 34,600
Grand Total			$173,100	$173,100	$173,100

Funds available in Park Base: $83,400

Funds requested from Regional Office: $89,700

11. REFERENCES AND CONTACTS:

a. Bancroft, William L.
Chief of Resources Management
Sequoia and Kings Canyon National Parks

b. Castro, Charles
Forestry Foreman
Sequoia and Kings Canyon National Parks

c. Sequoia and Kings Canyon National Parks
Vegetation Management Plan

d. Forestry Assistance Act, PL. 35-313, Sec. 5

12. DATE OF SUBMISSION: June, 1981

NATURAL RESOURCES PROJECT STATEMENT

1. PARK AND REGION: Sequoia and Kings Canyon National Parks; Western Region.

2. PROJECT NAME AND NUMBER: Eradicate Exotic Beaver; RM-11

3. STATEMENT OF PROBLEM: In the Kern Canyon, exotic beaver are destroying the natural environment by constructing dams and restricting the natural flow of the river, backing up vast quantities of water, changing the vegetation and aquatic environments. In one area a trail was flooded by the backed up water. The changes in the stream could be adversely effecting fish populations by silt deposition on spawning gravel. Both the species composition and abundance of aquatic invertebrates would be changed as riffles with rich faunal assemblages become depauperate pools. Sometimes the dams break during high water causing unusual erosion downstream.

4. WHAT HAS BEEN DONE: A reduction program was executed by U.S. Fish and Wildlife Service personnel in 1969 and 1970. Survey of the area in 1974 revealed that the beaver population now approximates the pre-1969 level.

5. DESCRIPTION OF THE WORK TO BE UNDERTAKEN: Additional temporary Park Technicians would provide the necessary manpower to control beaver and their dams in the Kern Canyon and restore once-flooded areas. Since it is difficult, if not impossible, to remove all of the beavers in the Park, reduction will be aimed at leaving as few beavers as possible. The Parks will encourage the project to be expanded to an interagency cooperative project that would include Sequoia National Forest; this would increase the potential for complete extirpation.

   Efficient application of remedial measures requires monitoring and survey to determine effects of beaver tree cutting, water impoundment, impact on the vegetation and stream ecology.

6. LENGTH OF TIME NEEDED: This is a continuing project, unless the beaver can be completely extirpated.

7. WHAT WILL HAPPEN IF PROJECT IS NOT UNDERTAKEN: Exotic beaver will continue to alter the natural environment until a new vegetative regime is established.

8. WHAT ARE THE ALTERNATIVES: Accept the ecological changes and hope that the population does not continue to expand.

9. PERSONNEL: One temporary Park Technician, GS-5, and three temporary Park Aids, GS-3, would be added to the Park staff.

10. ADMINISTRATION AND LOGISTICS: The Program will be administered by the Fish and Wildlife Specialist. Form 10-237 submitted October 18, 1976.

FUNDING:

	Year in Program Sequence				
	1st	2nd	3rd	4th	5th
Personal Services				$13,800	$13,800
Other than Personal Services				$ 3,500	$ 3,500
Grand Total				$17,300	$17,300

Funds available in Park Base: None

Funds requested from Regional Office: $17,300 added to Park Base.

11. REFERENCES AND CONTACTS

a. Nokes, George
Director, Region IV
California Department of Fish and Game
Fresno, California

b. Werner, Harold
Fish and Wildlife Specialist
Sequoia and Kings Canyon National Parks

12. DATE OF SUBMISSION: June, 1981

NATURAL RESOURCES PROJECT STATEMENT

1. PARK AND REGION: Sequoia and Kings Canyon National Parks; Western Region

2. PROJECT NAME AND NUMBER: Professional and Technical Support for Vegetation Management; RM-12

3. STATEMENT OF PROBLEM: Vegetation management is a diverse program that includes hazard tree identification and classification, insect and disease management, analysis of backcountry visitor impact on the vegetation resources, restoration of meadow ecosystems, management of endangered plant species, removal of exotic plant species, and field monitoring of all of the above programs. Program planning, development, coordination, implementation, and monitoring cannot be accomplished by less than full time, nonprofessional employees. Professional direction and management by a Vegetation Management Specialist assisted by a staff of temporary technicians and support costs is absolutely essential if a fully coordinated and planned program is to exist.

4. WHAT HAS BEEN DONE: No unified program has existed under the direction of a professional Vegetation Management Specialist. Responsibility for resources management, under the Chief of Resources Management is one of many diverse efforts. The program, as it now operates is seriously under staffed and under funded.

5. DESCRIPTION OF WORK TO BE UNDERTAKEN: A vegetation management team will develop an action plan that will establish objectives and procedures for conducting the diverse vegetation management programs. This team will monitor, evaluate, and conduct necessary studies to support these programs based on their evaluation. The long range action plans will be refined and updated as needed to be responsive to change in the Parks' ecosystems.

6. LENGTH OF TIME NEEDED: This is a continuing project.

7. WHAT WILL HAPPEN IF PROJECT IS NOT UNDERTAKEN: The natural vegetative mosaic will not be achieved and modified ecosystems will continue to prevent visitors from witnessing "natural" conditions needed for self sustaining plant communities. Major adverse impacts on threatened and endangered plants will occur. Crisis management will continue to prevent long range effective planning.

8. WHAT ARE THE ALTERNATIVES:

   a. No action.

b. Continue to operate at the current level.

c. Expand the program to adequately monitor and evaluate vegetation management programs.

9. PERSONNEL: A permanent Vegetation Management Specialist, GS-11, and four temporary Forestry Technicians, IGS-462-5, will be added to the Park staff.

10. ADMINISTRATION AND LOGISTICS: Supervision will be carried out by the Chief of Resources Management. Form 10-237 submitted February 22, 1980.

FUNDING

	Year in Program Sequence				
	1st	2nd	3rd	4th	5th
Personal Services			$72,300	$72,300	$72,300
Other than Personal Services			$18,100	$18,100	$18,100
Grand Total			$90,400	$90,400	$90,400

Funds available in Park Base: $24,200

Funds requested from Regional Office: $66,200 to be added to Park Base.

11. REFERENCES AND CONTACTS:

Bancroft, William L.
Chief of Resources Management
Sequoia and Kings Canyon National Parks

12. DATE OF SUBMISSION: June, 1981

NATURAL RESOURCES PROJECT STATEMENT

1. PARK AND REGION: Sequoia and Kings Canyon National Parks; Western Region.

2. PROJECT NAME AND NUMBER: Reestablish Natural Vegetation Mosaic in Campgrounds and Developed Areas; RM-13.

3. STATEMENT OF PROBLEM: Modifying human influences, such as excessive hazard tree removal, trampling, soil compaction, reduction or removal of natural ground cover, and mechanical abuses, have combined to upset and retard natural regenerative processes and disrupt the natural scene within the campgrounds and developed areas. These areas need to be restored to more natural conditions.

4. WHAT HAS BEEN DONE: Nothing.

5. DESCRIPTION OF WORK TO BE UNDERTAKEN: Vegetation used to recreate the vegetative mosaic for this project will be transplanted from nearby areas. Approximately 1,000 acres of campgrounds and developments are involved.

6. LENGTH OF TIME NEEDED: Because damage will continue to occur as long as facilities are operated, this will be a continuing project.

7. WHAT WILL HAPPEN IF PROJECT IS NOT UNDERTAKEN: As natural regeneration continues to degenerate, understory, and eventually overstory, will become increasingly sparse and the resulting scene will become increasingly unnatural.

8. WHAT ARE THE ALTERNATIVES:

   a. No action.

   b. The natural vegetation mosaic would only be reestablished in campgrounds and developed areas where research has shown that it is feasible.

9. PERSONNEL: One temporary equipment operator, WG-8; one temporary Forestry Leader, WL-6; two temporary Forestry Technicians, IGS-5; two temporary Axeman, WG-4; and two temporary laborers WG-3, would be added to the Park staff.

10. ADMINISTRATION AND LOGISTICS: This program will be executed under the supervision of the Chief of Resources Management. On Form 10-237, submitted October 18, 1976.

FUNDING

	Year in Program Sequence				
	1st	2nd	3rd	4th	5th
Personal Services				$56,000	$56,000
Other than Personal Services				$26,000	$26,000
Grand Total				$82,000	$82,000

Funds available in Park Base: None.

Funds requested from Regional Office: $82,000 to be added to Park Base.

11. REFERENCES AND CONTACTS:

a. Bancroft, William L.
Chief of Resources Management
Sequoia and Kings Canyon National Parks

b. Parmeter, J. R., Jr.,
Professor of Plant Pathology
University of California
Berkeley, California

12. DATE OF SUBMISSION: June, 1981

NATURAL RESOURCES PROJECT STATEMENT

1. PARK AND REGION: Sequoia and Kings Canyon National Parks; Western Region

2. PROJECT NAME AND NUMBER: Removal of Abandoned Fences; RM-15.

3. STATEMENT OF PROBLEM: Numerous fences were constructed in conjunction with past grazing activities throughout the wilderness. Many now serve no function and constitute physical incursions on the wilderness quality of the backcountry as well as safety hazards to visitors and wildlife.

4. WHAT HAS BEEN DONE: Some fence removal has been done in a haphazard manner only as time, manpower, and funds have permitted.

5. DESCRIPTION OF THE WORK TO BE UNDERTAKEN: If this project is funded, all fences not deisgnated as necessary for the meadow management system will be removed. Posts will be destroyed and wire will be packed out by stock or flown out by helicopter to solid waste disposal stations.

6. LENGTH OF TIME NEEDED: Two summer seasons of concentrated effort are required.

7. WHAT WILL HAPPEN IF PROJECT IS NOT UNDERTAKEN: If this project is not undertaken, the most visible and accessible fences will probably be eventually removed, but it will take several years to accomplish and the time and funds used will be taken from important visitor protection, trail maintenance, and soil and moisture conservation activities. Other old fences will remain and very slowly decompose.

8. WHAT ARE THE ALTERNATIVES:

   a. No action.

   b. Remove the fences.

9. PERSONNEL: One temporary Animal Packer, WG-7, and three temporary Laborers, WG-3.

10. ADMINISTRATION AND LOGISTICS: This two year project will be administered in conjunction with existing soil and moisture conservation under the supervision of the Chief of Resources Management. On form 10-237, submitted October 18, 1976.

FUNDING

	Year in Program Sequence				
	1st	2nd	3rd	4th	5th
Personal Services				$15,900	$15,900
Other than Personal Services				$ 6,400	$ 6,400
Grand Total				$22,300	$22,300

Funds Available in Park Base: None

Funds Requested from Regional Office: $22,300 for two years

11. REFERENCES AND CONTACTS:

a. Bancroft, William L.
Chief of Resources Management
Sequoia and Kings Canyon National Parks

b. Castro, Charles
Forestry Foreman
Sequoia and Kings Canyon National Parks.

12. DATE OF SUBMISSION: June, 1981

NATURAL RESOURCES PROJECT STATEMENT

1. PARK AND REGION: Sequoia and Kings Canyon National Parks; Western Region.

2. PROJECT NAME AND NUMBER: Naturalize Cut Stumps and Logs; RM-16

3. STATEMENT OF PROBLEM: Past tree removal activities by both Park and contract personnel have produced numerous cut stumps and log faces throughout the Parks within and surrounding developed areas and road prisms. These cuts are tangible incursions on the natural scene which the Parks attempt to preserve.

4. WHAT HAS BEEN DONE: Present policy is to obliterate these cuts as they occur. However, funds are not available to obliterate the stumps and cut faces which were generated in the past.

5. DESCRIPTION OF WORK TO BE UNDERTAKEN: The cuts will be blasted by contracted personnel.

6. LENGTH OF TIME NEEDED: One work season (May through October).

7. WHAT WILL HAPPEN IF PROJECT NOT UNDERTAKEN: Cut stump faces and logs will remain until they decompose.

8. WHAT ARE THE ALTERNATIVES:

   a. No action.

   b. Remove only the cut stumps in developed areas and other areas of high visitor use.

9. PERSONNEL: Contracted personnel.

10. ADMINISTRATION AND LOGISTICS: Work will be directed by Resources Management personnel. Form 10-237 submitted October 18, 1976.

FUNDING

	Year in Program Sequence				
	1st	2nd	3rd	4th	5th
Personal Service					
Other than Personal Services					$11,400
Grand Total					$11,400

Funds available in Park Base: None

Funds requested from Regional Office: $11,400 for one year.

11. REFERENCES AND CONTACTS:

Bancroft, William L.
Chief of Resources Management
Sequoia and Kings Canyon National Parks

12. DATE OF SUBMISSION: June, 1981

NATURAL RESOURCES PROJECT STATEMENT

1. PARK AND REGION: Sequoia and Kings Canyon National Parks; Western Region.

2. PROJECT NAME AND NUMBER: Preserve Mountain Meadow Resources; RM-18

3. STATEMENT OF PROBLEM: Fragile mountain meadows are subject to a variety of activities including hiking, camping, and grazing pack and saddle stock. Such uses, when unregulated, contribute to accelerate erosion and adversely affect vegetation, water movement and water table. The condition of these meadows must be continuously evaluated by established techniques so as to detect and correct changes that contribute to deterioration.

4. WHAT HAS BEEN DONE: The condition of selected meadows has been evaluated by Sharsmith, Armstrong, DeBennedetti, and others. However, these studies have been infrequent and evaluation and modification of management programs resulting from these studies have not been based on objective biological criteria. Remedial efforts to correct deterioration have been made in meadows where gross overuse was evident.

5. DESCRIPTION OF WORK TO BE UNDERTAKEN: Regular inventorying of the vegetation to find changes in species composition, water relations, and other indicators of meadow condition. Use of meadows must be adjusted to assure deterioration does not occur and, where deterioration has already begun, use must be adjusted to return to natural conditions. Damage to meadows must be corrected to reverse deterioration. Erosion protection devices must be installed and areas denuded by human-caused activities revegetated.

6. LENGTH OF TIME NEEDED: Continuing as long as meadows are utilized by Park visitors and employees.

7. WHAT WILL HAPPEN IF PROJECT NOT UNDERTAKEN: Unless this work is performed, the true condition of meadows and their condition trend will not be known. Some meadows would continue to deteriorate while use of others will be unnecessarily restricted.

8. WHAT ARE THE ALTERNATIVES:

   a. No action.

   b. Restore only the most seriously disturbed meadows.

   c. Close some meadow areas to visitor use and allow natural processes to reclaim the area.

9. PERSONNEL: One temporary Forestry Leader, WL-5; one Animal Packer WG-7; one Park Technician GS-5; and three Axeman WG-4, will be added to the Park staff.

10. ADMINISTRATION AND LOGISTICS: Inventory and corrective efforts will be under the supervision of the Chief of Resources Management. Corrective efforts will be done in conjunction with exisitng soil and moisture conservation programs and organization. Form 10-237 submitted October 18, 1976.

FUNDING

	Year in Program Sequence				
	1st	2nd	3rd	4th	5th
Personal Services			$38,900	$38,900	$38,900
Other than Personal Services			$ 9,700	$ 9,700	$ 9,700
Grand Total			$48,600	$48,600	$48,600

Funds available in Park Base: $7,600

Funds requested from Regional Office: $41,000 to be added to Park Base.

11. REFERENCES AND CONTACTS:

a. Armstrong, John E. 1942. A study of grazing in the Roaring River District, Kings Canyon National Park, with recommendations. 176 pp.

b. Black, Bruce W. 1951. Conditions in the Roaring River Section of Kings Canyon. Manuscript.

c. Sharsmith, Carl W. 1959. A report on the Status, Changes, and Ecology of Back Country Meadows in Sequoia and Kings Canyon National Parks. 122 pp., 121 figs. Manuscript.

_____1961. A Report on the Status, Changes, and Comparative Ecology of Selected Back Country Meadow Areas in Yosemite National Park that Receive Heavy Visitor Use. 57 pp., 42 figs. Manuscript.

d. Sumner, Lowell E. 1941. Special Report on Range Management and Wildlife Protection in Kings Canyon National Parks. 288 pp. Manuscript.

_____1948. Tourist Damage to Mountain Meadows in Sequoia and Kings Canyon National Parks 1935 to 1938. 29 pp. Manuscript.

e. Sumner, Lowell and Richard M. Leonard. 1947. Protecting Mountain Meadows. Sierra Club Bulletin, Vol. 32, pp. 53-62.

f. Thede, Maurice E., Lowell Sumner, and William T. Briggle. 1961. A Back Country Management Plan for Sequoia and Kings Canyon National Parks. 200 pp., 26 figs. Manuscript.

12. DATE OF SUBMISSION: June, 1981

NATURAL RESOURCES PROJECT STATEMENT

1. PARK AND REGION: Sequoia and Kings Canyon National Parks; Western Region.

2. PROJECT NAME AND NUMBER: Dwarfmistletoe Control; RM-19

3. STATEMENT OF PROBLEM: Dwarfmistletoe is a parasitic plant which weakens, deforms, and kills coniferous trees. Its incidence and intensity have reached epidemic levels in the Cedar Grove developed area. The parasite threatens to decimate the forest stand within the valley and spread to adjacent forested areas.

4. WHAT HAS BEEN DONE: Pruning and thinning operations of portions of the Cedar Grove Valley were conducted between 1964 and 1966. Since no funds were available for a continuing maintenance program, no work has been conducted since 1966. As a result, dwarfmistletoe has, once again, regained its former level of intensity.

5. DESCRIPTION OF THE WORK TO BE UNDERTAKEN: Selective pruning and thinning will be done annually to control, and then prevent, the spread of the disease. Such pruning will also remove limb hazards, caused by the parasitic growths, which threaten public safety in the area.

6. LENGTH OF TIME NEEDED: Continuing. In its initial stages the project will be characterized by intensive pruning and thinning to achieve control. That stage will be followed by annual detection searches and pruning to maintain control.

7. WHAT WILL HAPPEN IF PROJECT NOT UNDERTAKEN: There will be an unnecessary loss of trees. Campgrounds and all other developed areas will be gradually denuded of conifers and reproduction will be eliminated as sound trees are infected. Visitors will be subjected to increasing levels of hazard from limb and tree failures. Preservation of a mixed conifer forest stand in the Cedar Grove area will not be achieved.

8. WHAT ARE THE ALTERNATIVES:

   a. No action.

   b. Remove the dwarfmistletoe.

9. PERSONNEL: One seasonal Forestry Worker, one seasonal Sawyer, and one seasonal Axeman will be added to the Forestry Crew.

10. ADMINISTRATION AND LOGISTICS: The project will be carried out in conjunction with other woodsworker activities such as hazard tree removal and forest pest control under the supervision of the Chief of Resources Management. On form 10-237 submitted October 18, 1976.

FUNDING

	Year in Program Sequence				
	1st	2nd	3rd	4th	5th
Personal Services					$13,600
Other than Personal Services					$ 5,400
Grand Total					$19,000

Funds Available in Park Base: None.

Funds Requested from Regional Office: $19,000 to be added to Park Base.

11. REFERENCES AND CONTACTS:

a. Bancroft, William L.
Chief of Resources Management
Sequoia and Kings Canyon National Parks

b. Castro, Charles
Forestry Foreman
Sequoia and Kings Canyon National Parks

c. Pronos, John
Forest Pathologist
U.S. Forest Service
San Francisco, California

12. DATE OF SUBMISSION: June, 1981

NATURAL RESOURCES PROJECT STATEMENT

1. PARK AND REGION: Sequoia and Kings Canyon National Parks; Western Region.

2. PROJECT NAME AND NUMBER: Wilderness Use Monitoring; RM-21

3. STATEMENT OF PROBLEM: In order to manage wilderness to provide for maximum use and enjoyment without ecosystem deterioration it is necessary to monitor use areas, especially impacted areas. Actual conditions must be related, quantitatively, to an acceptable environmental standard. When conditions fall below standards, permitted visitor use must be adjusted to allow for recovery.

4. WHAT HAS BEEN DONE: Control of use and data gathering is accomplished for broad use areas through the wilderness control system implemented at Park trailheads. Subjective information, of varying quality and content, regarding impacted areas is communicated on irregular basis from temporary backcountry rangers and permanent NPS personnel.

5. DESCRIPTION OF WORK TO BE UNDERTAKEN: A team will travel throughout the wilderness area applying standards and techniques developed through research to acquire objective and standardized data regarding the degree of human impact at popular use areas. Such data will form the foundation for management to control visitor impact.

6. LENGTH OF TIME NEEDED: This is a continuing project.

7. WHAT WILL HAPPEN IF PROJECT NOT UNDERTAKEN: If monitoring is not provided, either (1) areas impacted by improper use will continue to deteriorate and natural resources will be irretrievably lost; or (2) use will be unnecessarily denied in areas exceeding the established standards of protection.

8. WHAT ARE THE ALTERNATIVES:

   a. No action.

   b. Continue to receive information from rangers on areas of impact on a sporadic basis.

   c. Develop a monitoring team to systematically assess visitor impact.

9. PERSONNEL: Two temporary Park Technicians, IGS-4, will be added to the Park staff.

10. ADMINISTRATION AND LOGISTICS: The project will be carried out under the training and supervision of the Chief of Resources Management in co-operation with the Research Scientist and Chief Park Ranger. On Form 10-237 submitted October 18, 1976.

FUNDING

	Year in Program Sequence				
	1st	2nd	3rd	4th	5th
Personal Services				$15,000	$15,000
Other than Personal Services				$ 5,000	$ 5,000
Grand Total				$20,000	$20,000

Funds available in Park Base: None.

Funds requested from Regional Office: $20,000 to be added to Park Base.

11. REFERENCES AND CONTACTS:

a. Bancroft, William L.
Chief of Resources Management
Sequoia and Kings Canyon National Parks

b. Parsons, David J.
Research Scientist
Sequoia and Kings Canyon National Parks

12. DATE OF SUBMISSION: June, 1981

NATURAL RESOURCES PROJECT STATEMENT

1. PARK AND REGION: Sequoia and Kings Canyon National Parks; Western Region.

2. PROJECT NAME AND NUMBER: Monitoring and Management of Threatened and Endangered Species, RM-22.

3. STATEMENT OF PROBLEM: Of the Parks' fauna, one species is listed as threatened (Little Kern golden trout). Three endangered species are the peregrine falcon, California condor, and bald eagle. The entire distribution of pure Little Kern golden trout is not known and known populations need to be monitored. Since specimens from pure populations are being used for restoring them to their original distribution, it is particularly important to monitor impacts to the pure fish and the success of transplanted individuals. Formerly, at least one peregrine eyrie was known in Sequoia National Park, and condors are suspected to possibly nest in another area of Sequoia. Both of these species are still seen intermittantly as well as bald eagles. However, their status within these Parks is unknown.

4. WHAT HAS BEEN DONE: The Little Kern golden trout in Soda Springs Creek has been surveyed several times with wide discrepancies in population estimates. Critical habitat has been identified for the Soda Springs population. Other trout and hybrids have been removed from the drainage within the Park, and some pure specimens have been moved to restock the treated waters.

   In 1980, 20 person-days were set aside to initiate surveying the status of the Endangered birds.

5. DESCRIPTION OF WORK TO BE UNDERTAKEN: These Parks need to be throughly and systematically surveyed for these species, their actual status determined, and the vitality of populations monitored. If there are no (or few) peregrine falcons breeding within these Parks, the feasibility of their reintroduction shall be evaluated and implemented. Where appropriate, critical habitat should be identified.

6. LENGTH OF TIME NEEDED: This is a continuing project.

7. WHAT WILL HAPPEN IF PROJECT IS NOT UNDERTAKEN: The status of these species and management practices (such as trail locations) will remain unknown. These Parks will not have adequate information for Section 7 consultations. Without this information these Parks could unknowingly ingage in management practices that violate the Endangered Species Act (amended) and undertake actions (e.g. certain types of fire suppression at wrong locations; new trail locations, etc.) that truely endanger a species presence within these Parks.

8. WHAT ARE THE ALTERNATIVES: Continue to get this information opportunistically from visitor/ranger reports and hope that it is accurate and sufficient.

9. PERSONNEL: One temporary Park Technician, IGS-5, will be added to the Parks' staff. This would probably be implemented as an extension of an existing position.

10. ADMINISTRATION AND LOGISTICS: Except for the initial RBI studies which will be done by Research, the long-term monitoring and any reintroduction program will be administered by the Fish and Wildlife Specialist.

FUNDING

	Year in Program Sequence				
	1st	2nd	3rd	4th	5th
Personal Services				$7,000	$7,000
Other than Personal Services				$1,800	$1,800
Grand Total				$8,800	$8,800

Funds available in Park Base: $1,700

Funds requested from Regional Office: $2,100 plus $5,000 peregrine falcon reintroduction if evaluation is desireable.

11. REFERENCES AND CONTACTS:

a. Werner, Harold
Fish and Wildlife Specialist
Sequoia and Kings Canyon National Parks

b. Coffey, Mike
Biological Technician
Sequoia and Kings Canyon National Parks

c. Christenson, Dan
Endangered Species Coordinator
California Department of Fish and Game
Fresno, California

12. DATE OF SUBMISSION: June, 1981

NATURAL RESOURCES PROJECT STATEMENT

1. PARK AND REGION: Sequoia and Kings Canyon National Park; Western Region.

2. PROJECT NAME AND NUMBER: Staff Support for Cave Management; RM-23.

3. STATEMENT OF PROBLEM: The Park has a highly significant cave resource. At least 70 caves are known within the Parks. Some are well known and Lilburn Cave is the largest cave in California. However, management of this resource is diffused between too many individuals to be effective. Cave management is coordinated by the Environmental Management Committee, though all Park Divisions have an interest in some phase of their management. Many of the caves are probably better known by visiting cavers than by the Parks own staff. Cave resources are extremely delicate and essentially non-renewable. This leaves no latitude for errors in their management, mistakes could be irrepairable. The Parks currently lack sufficient personnel and expertise to adequately manage its cave resources.

4. WHAT HAS BEEN DONE: The Park has some records on its cave resources and a cave intentory is being completed by the Cave Research Foundation in co-operation with the Park. Information describing several of the caves has been published; this can be detrimental to their security to the extent that their locations are revealed. Several of the caves are gated and locked.

5. DESCRIPTION OF WORK TO BE UNDERTAKEN: A full time Cave Specialist is needed to coordinate management of the Parks cave resource. This would include:

   a. Maintaining the cave inventory.

   b. Monitoring the impact of existing use.

   c. Coordinating all cave management activities.

   d. Establishing reasonable carrying capacities and use limitations on each cave.

   e. Serving as laison between the Park and caving organizations such as CRF and NSS.

   f. Attending professional meetings on cave management.

   g. Developing and maintaining a cave management plan that will insure the safety of cave visitors and protect the cave resource from irrepairable misuse.

h. Developing and implementing a permit system to monitor use and control cave access, except for guided tours in Crystal Cave.

i. Insuring that existing and future gates are not detrimental to their respective caves.

j. Searching for, exploring, and inventorying new caves.

k. Recommending appropriate management for each Park cave.

6. LENGTH OF TIME NEEDED: This is a continuing project.

7. WHAT WILL HAPPEN IF PROJECT NOT UNDERTAKEN: The cave management program will continue to be poorly coordinated and the likelihood of doing irrepairable damage to this outstanding natural resource will be high.

8. WHAT ARE THE ALTERNATIVES: Proper management of caves requires specialized knowledge and skills. There are no feasible alternatives.

9. PERSONNEL: One subject to furlough Cave Specialist, GS-7, and a temporary Park Technician, GS-5, will be added to the Park staff.

10. ADMINISTRATION AND LOGISTICS: The program will be administered by the Chief of Resources Management.

FUNDING

	Year in Program Sequence				
	1st	2nd	3rd	4th	5th
Personal Services				$29,900	$29,900
Other than Personal Services				$ 3,400	$ 3,400
Grand Total				$33,300	$33,300

Funds available in Park Base: None.

Funds requested from Regional Office: $33,300

11. REFERENCES AND CONTACTS:

a. Palmer, John
Chief of Interpretation
Sequoia and Kings Canyon National Parks

b. Werner, Harold
Fish and Wildlife Specialist
Sequoia and Kings Canyon National Parks

12. DATE OF SUBMISSION: June, 1981

NATURAL RESOURCES PROJECT STATEMENT

1. PARK AND REGION: Sequoia and Kings Canyon National Parks; Western Region.

2. PROJECT NAME AND NUMBER: Restore Abandoned Trails and Roads to Natural Conditions; RM-25.

3. STATEMENT OF PROBLEM: Where trails and roads have been relocated and/or abandoned and steps were not taken to naturalize the sites or retard the development of erosive process significant damage to Park resources is occurring. Displacement of soil, gullying, denuding of slopes, and unsightly scars on the landscape are all taking place in varying, but increasing degrees.

4. WHAT HAS BEEN DONE: Some volunteer efforts towards trail obliteration have been made. While well intentioned, many lacked expert direction and resulted in increased damage to the natural scene or had no effect on preventing continued damage.

5. DESCRIPTION OF WORK TO BE UNDERTAKEN: The basic principles of soil and moisture conservation must be applied to abandoned roads and trails. Such applications include the construction of water turning devices, revetments, and establishment of vegetation on denuded slopes.

6. LENGTH OF TIME NEEDED: This is a continuing project.

7. WHAT WILL HAPPEN IF PROJECT NOT UNDERTAKEN: Erosion will increase, especially in times of heavy runoff and on steeper slopes. Scars from erosion tranches will deepen and multiply and soil will be displaced and deposited in streams and onto scenic meadows and flats.

8. WHAT ARE THE ALTERNATIVES:

   a. Do not restore abandoned trails and roads to natural conditions.

   b. Select only the most severely eroded trails and roads to restore to natural conditions.

9. PERSONNEL: One temporary Sawyer/Woodsworker, WG-5; one temporary Axeman, WG-4; and one temporary Laborer, WG-3, will be added to the Park staff.

10. ADMINISTRATION AND LOGISTICS: Work will be done in conjunction with existing soil and moisture activities under the supervision of the Chief of Resources Management. On Form 10-237, submitted 10/18/76.

FUNDING

	Year in Program Sequence				
	1st	2nd	3rd	4th	5th
Personal Services				$20,100	$20,100
Other than Personal Services				$ 5,000	$ 5,000
Grand Total				$25,100	$25,100

Funds available in Park Base: None

Funds requested from Regional Office: $25,100 to be added to Park Base.

11. REFERENCES AND CONTACTS:

Bancroft, William L.
Chief of Resources Management
Sequoia and Kings Canyon National Parks

12. DATE OF SUBMISSION: June, 1981

NATURAL RESOURCES PROJECT STATEMENT

1. PARK AND REGION: Sequoia and Kings Canyon National Parks; Western Region.

2. PROJECT NAME AND NUMBER: Use of Prescribed Fire and Fire Protection to Reduce the Wildfire Threat to Resoruces and Safety; RM-30.

3. STATEMENT OF PROBLEM: Wildfire is a proven threat to the security of park resources, personnel, and visitors. Hot summers and steep topography frequently result in rapid growth of fires which are difficult and expensive to suppress. Prescribed burning to reduce fuelloads and sufficient personnel to perform initial attack on wildfire is needed to mitigate this threat.

   The present fire crew size consists of two crew members in each of three subdistricts and one in the fourth subdistrict. This does not begin to provide even minimum strength for initial attack or to perform prescribed burns at a significant level. The Parks are more vulnerable to wildfire than at any other time in their history.

4. WHAT HAS BEEN DONE: Prescribed burning is currently being done primarily in the backcountry. Fire crews provide protection to physical facilities and natural resources in developed areas in the frontcountry.

5. DESCRIPTION OF WORK TO BE UNDERTAKEN: The fire crew will be increased to three in each of the four major developed areas in the Parks, providing the minimum acceptable level of fire protection. Fire caches will be maintained at a proper level of supply. A ten-person Fire Management Team will provide sufficient personnel to perform prescribed burns of significant size to reduce the wildfire threat. Two Resource Management Technicians will be added to evaluate the effects of the increased number of burns on park resources.

6. LENGTH OF TIME NEEDED: This is a continuing project.

7. WHAT WILL HAPPEN IF PROJECT NOT UNDERTAKEN: There will not be adequate fire protection for the four major developed areas. Visitor safety, physical facilities, and natural resources will be threatened by wildfire, and a repeat of the 10,000-acre, 1.1 million dollar Lewis Creek fire of 1980 is inevitable.

8. WHAT ARE THE ALTERNATIVES:

   a. Maintain the current fire protection level in the four major developed areas and continue to prescribe burn 1000-3000 acres/year.

b. Increase the level of the fire crews to an acceptable level, prescribe burn at current rate.

c. Increase fire crew size to an acceptable level tp provide adequate fire protection in the Parks' developed areas and conduct a more extensive prescribed burning program with a Fire Management Team which will travel throughout the Parks reducing fuel loads with prescribed burns.

9. PERSONNEL: One permanent less than full time GS-5 and two GS-6 Park Technicians, one temporary IGS-5 Park Technician, and 13 temporary IGS-4 Park Technicians will be added to the Park staff.

10. ADMINISTRATION AND LOGISTICS: This project is under the supervision of the Fire Management Officer and the Chief of Resources Management. On Form 10-237, submitted March 13, 1981.

FUNDING

	Year in Program Sequence			
1st	2nd	3rd	4th	5th
Personal Services:	$346,100	$346,100	$346,100	$346,100
Other than Personal Services:	$ 86,500	$ 86,500	$ 86,500	$ 86,500
Grand Total	$432,600	$432,600	$432,600	$432,600

Funds Available in Park Base: $300,600

Funds requested from Regional Office: $132,000

11. REFERENCES AND CONTACTS:

a. Bancroft, William L.
Chief of Resources Management
Sequoia and Kings Canyon National Parks

b. Nichols, Howard T.
Environmental Specialist
Sequoia and Kings Canyon National Parks

c. Sequoia and Kings Canyon National Parks Fire Management Plan

12. DATE OF SUBMISSION: June, 1981

Wildfire
A Threat to Sequoia and Kings Canyon National Parks

By

Tom Nichols
Environmental Specialist

October 1980

I. INTRODUCTION

A memo to the Western Regional Director on October 10, 1980, identified wildfire as a major threat to the natural resources of Sequoia and Kings Canyon National Parks. The 9,000 acre Lewis Creek Fire and the much smaller, but potentially explosive, Sunset Fire in Giant Forest have pointed out vividly the magnitude and danger of the wildfire threat.

This paper will examine the nature of the wildfire threat, propose alternatives and examine their consequences, select an alternative and describe a proposed action program which will deal with this threat.

II. STATEMENT OF THE PROBLEM

The origin of the wildfire threat has been discussed many times and further elaboration is not needed. The increases in fuel as a result of the suppression of fires and the resultant higher intensity fires combined with a high density of visitation pose threats to resources and human safety alike.

The recognition that fire is an integral process to the various ecosystems of the Sierra Nevada gave rise to the natural fire and prescribed burning programs. These have reduced the wildfire threat to a degree; but the natural fire program is confined largely to high, remote areas of the Parks where suppression did not affect fuel loads significantly, while the prescribed burning program has been hampered from its inception by insufficiently trained personnel and funding.

The bulk of the funding for fire management has historically been for suppression, which has been highly successful. In the 9,000 acre area which was burned by the Lewis Creek Fire, 40 fires of all origins had been suppressed over the last 60 years, the largest being 20 acres. The lesson seems to be that suppression can catch virtually all of the fires before they become destructively large, but eventually one is likely to get away and therefore negate past efforts.

These wildfires threaten the Parks' visitors; damage resources which are adapted to fire of less extreme intensity; and put up vast quantities of smoke. The cost of these fires in incredibly high - $1.1 million dollars for the Lewis Creek Fire, or $120/acre, as opposed to $4.64/acre for the 1979 prescribed burns. Of the four major threats to the Parks (air and water pollution, wildfire, and human impact), wildfire produces the greatest known threat to both resource integrity and human safety.

III. ALTERNATIVES AND CONSEQUENCES

A. Increase Suppression Efforts

The percentage of wildfires which become large (> 10 acres) could be decreased by increasing suppression crews and presuppression work. Initial attack would be in greater force; a specialized unit similar to a Forest Service Hotshot Crew could also be formed. Quicker, more aggressive firefighting would result.

This increased emphasis on fire suppression and on maintaining a high degree of readiness would do little to mitigate the negative impacts of withholding fire from systems which depend upon it for their perpetuation and health. The increased time spent in presuppression would be likely to detract from prescribed burn planning and implementation. The focus would be on one aspect of fire management, leading almost certainly to retrogression in the overall program.

B. Continue at Current Level

Burning at the FY-80 level is not flexible or extensive enough to reduce this threat to an acceptable level, within a reasonable period of time. Approximately 130,000 acres in the Parks need to be prescribed burned, and most of it is capable of burning in the rapid, intense manner of the Lewis Creek Fire. Burning needs to be done on a virtual year round basis, moving the crews to the various vegetation types as they come into prescription. Between 5,000 to 10,000 acres should be burned annually for 20 years to deal with this threat aggressively, an impossible task for the present fire crews.

Some 7,000 acres of sequoia groves and 500 acres near developed areas, such as Giant Forest, Cedar Grove and Grant Grove, are of very high priority, and need to be burned within the next 10 years to reduce the wildfire risk.

The current fire management program of approximately $264,500 provides for the skeleton of a flexible operation. With only two fire technicians in each district, fire protection is minimal and prescribed burning preparation and execution is necessarily hampered by a lack of personnel, as is initial attack on wildfire and presuppression work.

C. Increase Fire Management Funding

This alternative differs from Alternative A by developing a total

fire management program, including fire suppression, prescribed burning, and natural fire management instead of focusing on the suppression aspect. Fire management is no longer synonymous with suppression; and particularly in a park with such ecosystem diversity as Sequoia and Kings Canyon, no one strategy can work for all areas.

An increase of 10 GS-4 fire management seasonals and two GS-6 fire management technicians (10 month subject to furlough) and a two month increase in the fire season, particularly for spring burning, would cost $74,500. Two additional Resources Management fire monitors (GS-5) for seven months each would cost $13,200, a total of $101,700 including support. This increase in personnel and tour of duty would allow prescribed burning, and therefore smoke and possible visitor inconvenience, to be dispersed over a wider period of time and not be concentrated in the fall. Increased personnel will allow fire management sufficient strength to deal efficiently with the various strategies of suppression, presuppression, prescribed burning, and natural fire monitoring, which occasionally are all going on at once. The threat to the Park involves several thousand acres which will take over 20 years to treat once. Funding at this level will therefore be constant and ongoing until the threat is mitigated.

Public safety would be increased due to prescribed burning in a variety of ways. Wildfire threatens structures in Giant Forest, Grant Grove, Cedar Grove, and the topography in the Parks adds to this hazard. The dry, windy conditions of Cedar Grove and the steep, brush covered canyon wall on which the Generals Highway runs from Ash Mountain to Giant Forest could be highly dangerous in a wildfire.

Resources would also be less vulnerable to wildfire because of prescribed burning. Most deleterious effects caused by fire (erosion, air pollution, animal kills, timber to brush conversion) are due to high intensity wildfire. Prescribed burning effectively mitigates this threat, while returning fire to its natural role in the environment to the benefit of the ecosystems which are dependent upon it.

IV. PROPOSED ACTION PROGRAM

Of the three alternatives, C is our proposed strategy. The commitment we have to reintroducing fire as a process while meeting health, safety, and legal requirements cannot be served without an integrated fire management program. This program would require trained personnel in sufficient quantities to ensure that all aspects are reasonably covered.

An increase of $101,700 over the present level would increase the available personnel and expand the burning season. Wildfire would not only be more efficiently fought but also actively reduced as a threat through increased prescribed burning. The reintroduction of fire also benefits the species of the Parks which depend upon fire for their perpetuation.

V. CONCLUSION

Sequoia and Kings Canyon have developed strategies to aggressively deal with wildfires, a major threat to the Parks. We presently lack the funding to carry out these strategies in a fashion that will reverse the trend of increasingly dangerous wildfire potential. This paper has focused on possible methods in dealing with this threat.

NATURAL RESOURCES PROJECT STATEMENT

1. PARK AND REGION: Sequoia and Kings Canyon National Parks; Western Region.

2. PROJECT NAME AND NUMBER: Mitigation of Bear/Human Interactions; RM-31.

3. STATEMENT OF PROBLEM: The interaction between bears and visitors in recent years has created serious problems. This interaction has resulted in:

   a. Many bears acquiring unnatural foraging habits

   b. The destruction of up to 10 bears annually be management (43 destroyed during the last 10 years)

   c. Some visitors illegally shooting bears that raid their campsite

   d. Some visitors being injured by bears (at least 16 during the last decade)

   e. Visitors incurring up to $32,000 annually in property damage (10 year average - $12,600).

   Enough information about the Parks' bear population does not exist to accurately assess the long-term impact of existing losses to the bear population; and the other results are an unacceptable threat to visitor safety and their property. Such incidents also leave the Parks extremely vulnerable to tort claims.

   There were several incidents this year involving guns, visitors, and bears. One visitor shot a bear near a Park visitor center. Visitors have reported other visitors with guns chasing after bears, and several visitors have reported hearing low caliber gun shots when bears were in the area. Not only is there a high probability of bears being illegally killed or wounded, there is a high risk of another person being shot, wounded, or at least having property damaged by carelessly aimed rounds.

   The basic cause is improper food storage and garbage disposal by Park visitors. Bears are extremely intelligent, and when provided an opportunity, they quickly learn to seek food from people.

   The objective of the bear management program is to minimize this interaction with elimination of all available unnatural food sources and education of visitors as a primary goal. It will be necessary to identify, trap, and remove problem bears.

4. WHAT HAS BEEN DONE: A bear management program was started in 1974. Up to now the program has involved trapping and relocating bears, improving bear information media to the public, enforcement of food storage regulations, and construction of bear-proof garbage facilities. Some biological data has been acquired.

5. DESCRIPTION OF WORK TO BE UNDERTAKEN: The program is understaffed and underequipped during the bear season. More trained personnel are needed to work with the problem in each of the areas with significant bear problems. This will require technicians with interpretive skills, trained in drug-handling, immobilizing equipment, traps, and radio telemetry. Personnel assigned to this program must be available in a full-time basis during the critical spring/summer/fall season. Additional seasonal quarters are needed to house the additional help.

   Furthermore, bear-proof food storage lockers are needed at each campsite in campgrounds with significant bear problems.

6. LENGTH OF TIME NEEDED: This is a continuing project.

7. WHAT WILL HAPPEN IF PROJECT IS NOT UNDERTAKEN: Without this support, too many bears might be killed. Property will continue to be destroyed, and visitors will be injured occasionally.

8. WHAT ARE THE ALTERNATIVES: The alternatives are:

   a. Continue at current level, which itself may be reduced by budget cuts.

   b. Delete other existing fish and wildlife programs and concentrate all efforts on bear management.

   c. Upgrade the bear management program to permit: (a) construction of bear-proofed food storage facilities in campgrounds; (b) hiring sufficient personnel to explain and enforce proper food storage; (c) hiring trained personnel to identify and evaluate the seriousness of potential problem bears, to handle bears (capture and mark, measure, rehabilitate, relocate, and/or destroy), and to document impacts of the management program on the bear population; and (d) provide facilities and support for the additional personnel identified in (b) and (c).

   To accept the first alternative would mean that we could destroy up to 10 bears annually and visitors would continue to have unacceptable losses to their property and threats to their safety. The second alternative still would not provide sufficient personnel to work with bears in all of the areas with bear problems; the Parks still would not have needed food storage facilities; and other fish and wildlife programs, some of which are mandated by law, would not get done at all.

The third alternative is the only one that is acceptable.

9. PERSONNEL: Three temporary Park Technicians, IGS-5, will be added to the Campground Ranger staff. The Fish and Wildlife staff will gain three additional temporary Park Technicians, IGS-5, four additional temporary Park Aids, IGS-3, and funds to upgrade the existing Biological Technician to a GS-7/9.

10. ADMINISTRATION AND LOGISTICS: The program will be administered by the Fish and Wildlife Specialist. On Form 10-237 submitted Febuary 22, 1980.

FUNDING

	Year in Program Sequence				
	1st	2nd	3rd	4th	5th
Personal Services			$ 92,600	$ 92,600	$ 92,600
Other than Personal Services			$ 23,100	$ 23,100	$ 23,100
Grand Total			$115,700	$115,700	$115,700

Funds available in Park Base: $23,300

Funds requested from Regional Office: $354,500 non-recurring for bear lockers and housing; $92,400 of recurring costs to be added to Parks' Base.

11. REFERENCES AND CONTACTS:

a. Graber, David
Wildlife Biologist
Sequoia and Kings Canyon National Parks

b. Werner, Harold
Fish and Wildlife Specialist
Sequoia and Kings Canyon National Parks

12. DATE OF SUBMISSION: June, 1981

NATURAL RESOURCES PROJECT STATEMENT

1. PARK AND REGION: Sequoia and Kings Canyon National Parks; Western Region.

2. PROJECT NAME AND NUMBER: Deer Management and Monitoring, RM-32

3. STATEMENT OF PROBLEM: Unlike many of the other vertebrates within these Parks, deer have the capacity to significantly alter vegetation as their population increases. In turn, the stressed herds become sick and unsightly. Either a decrease in normal predation or a widespread improvement in the carrying capacity of their habitat could cause an unacceptable increase in their population. With the termination of hunting in Mineral King, the California Department of Fish and Game has expressed concern that deer there may become a problem if the herd continues to expand. Furthermore, the widespread use of both prescribed burning and prescribed natural fire in areas that burned very little during the last half century should create a widespread increase in the quantity and quality of browse, increasing the carrying capacity. The limited monitoring that has been done during the last several years indicates the deer herds in the Kaweah drainage are increasing. The effects of a high population density could generate social and political pressure for either hunting within these Parks, particularly in Mineral King, or a deer reduction program, neither of which is acceptable.

4. WHAT HAS BEEN DONE: During 1979 and 1980 deer herd population trends were monitored with eight 1/40th acre pellet-group transects in Mineral King Atwell Mill area and nine pellet group transects (1/40th acre) in the Giant Forest-Dorst area.

5. DESCRIPTION OF WORK TO BE UNDERTAKEN: A minimum of 90 additional transects are needed in the Kaweah drainage to provide reliable estimates of actual population trends. This was based on an analysis of existing data. These data would not only be helpful for responding to existing inquiries, but also for planning future management, particularly on their winter range outside these Parks, where the CDFG has expressed interest in special hunts to help regulate the population.

6. LENGTH OF TIME NEEDED: This is a continuing project.

7. WHAT WILL HAPPEN IF PROJECT IS NOT UNDERTAKEN: By improving our deer monitoring these Parks will be in a better position to recognize the actual problem (or lack of it) when responding to the public or when working cooperatively with CDFG on deer management.

8. WHAT ARE THE ALTERNATIVES: Continue to manage the herd using scant monitoring data and supposition based on general observations of deer herd and browse conditions.

9. PERSONNEL: One temporary Park Technician, IGS-5, will be added to the Parks' staff.

10. ADMINISTRATION AND LOGISTICS: The program will be administered by the Fish and Wildlife Specialist.

FUNDING

	Year in Program Sequence				
	1st	2nd	3rd	4th	5th
Personal Services			$7,500	$7,500	$7,500
Other than Personal Services			$1,900	$1,900	$1,900
Grand Total			$9,400	$9,400	$9,400

Funds available in Park Base: None

Funds requested from Regional Office: $8,900

11. REFERENCES AND CONTACTS:

a. Schulenburg, Bob
California Department of Fish and Game
Sacramento, California

b. Werner, Harold
Fish and Wildlife Specialist
Sequoia and Kings Canyon National Parks

12. DATE OF SUBMISSION: June, 1981

NATURAL RESOURCES PROJECT STATEMENT

1. PARK AND REGION : Sequoia and Kings Canyon National Parks; Western Region.

2. PROJECT NAME AND NUMBER: Staff Support for Fisheries Management Program, RM-33.

3. STATEMENT OF PROBLEM: The need to maintain natural fish population, yet sustain a viable sport fishery requires a thorough knowledge of: (1) sport fishing intensity, (2) angler success, (3) distribution of fishing pressure, (4) local fish population dynamics, and (5) the relationships of the preceeding to the Parks fishing regulations and management objectives. Maintaining a natural sport fishery is further complicated by a long tradition of stocking that has complicated future management options by: (1) populating numerous naturally barren lakes, (2) altering the natural distribution of fish, (3) introducing competitively superior exotic species, (4) modifying and sometimes destroying the original population through genetic introgression, and (5) creating a precedent which is socially and politically difficult to alter. Furthermore, the Park has a Federally listed threatened species, the Little Kern golden trout. The program needs full time involvement. The Fish and Wildlife Specialist is also involved in administering many other programs and can devote only a portion of his time to the fisheries program. Limited seasonal employment is available during the summer, however, additional seasonal employment and one full time technician are needed to adequately implement and monitor the program.

4. WHAT HAS BEEN DONE: Creel census and fish population studies have been initiated to provide some management information. However, the data is preliminary and insufficient for a sound management program. The Park collaborates with the California Department of Fish and Game on fisheries management issues and works with several agencies on the management of Little Kern golden trout. The Fish and Wildlife Specialist has done much of the work that should have been done by technicians.

5. DESCRIPTION OF WORK TO BE UNDERTAKEN: Technicians will collect field data on distribution of fishing activity and fisherman success. Fish populations will be sampled to monitor seasonal and long term trends of fished and unfished populations. Technicians will maintain an inventory of the fishery resources (lakes and streams). Fish and Wildlife personnel will continue to collaborate with the California Department of Fish and Game on fishery programs. This information will be used to evaluate and revise (as necessary) existing fisheries management practices. The LTFT Biological Technician will provide annual continuity, supervise field operations, and insure that the equipment is properly maintained.

6. LENGTH OF TIME NEEDED: This is a continuing project.

7. WHAT WILL HAPPEN IF PROJECT IS NOT UNDERTAKEN: The Park will not be able to adequately evaluate existing fishing regulations or other fish management activities (such as stocking) and will be poorly equipped to either improve the sport fishery or move toward a more natural fish population. Where stocking occurs, mistakes in selecting sites may continue to be a problem due to insufficient prestocking information; most of the survey data we are using now is old. The Park will not be able to identify the distribution of exotic species, evaluate their actual impact upon native species and, where necessary, take action to stop their spread. There would be relatively little information on either of fisheries success or the population they fished. Likewise, the Park would be poorly equipped to respond to the occasional requests it receives for information on Park fisheries.

8. WHAT ARE THE ALTERNATIVES: Alternatives would include alterations of the intensity at which the proposed field work is conducted. However, any reduction in the proposed work would increase the potential for mismanagement due to insufficient knowledge of the local fishery. Therefore, this is not a desirable alternative.

9. PERSONNEL: One subject to furlough Biological Technician (GS-7/9) and one temporary Park Technician (IGS-5) will be added to the Park staff.

10. ADMINISTRATION AND LOGISTICS: The program will be administered by the Fish and Wildlife Specialist.

FUNDING

	Year in Program Sequence				
	1st	2nd	3rd	4th	5th
Personal Services			$29,800	$29,800	$29,800
Other than Personal Services			$ 7,400	$ 7,400	$ 7,400
Grand Total			$37,200	$37,200	$37,200

Funds available in Park Base: $13,000

Funds requested from Regional Office: $24,200

11. REFERENCES AND CONTACTS:

a. Christenson, Dan, Endangered Species Coordinator, CDFG

b. Nokes, George, Director, Region IV, CDFG, Fresno

c. Standage, Richard, Fishery Biologist, Sequoia National Forest

d. Stevens, Stan, Fishery Biologist, CDFG, Visalia

12. DATE OF SUBMISSION: June, 1981

NATURAL RESOURCES PROJECT STATEMENT

1. PARK AND REGION: Sequoia and Kings Canyon National Parks; Western Region.

2. PROJECT NAME AND NUMBER: Support for Water Quality Analysis, RM-34.

3. STATEMENT OF PROBLEM: A good water quality program looks at both chemical and biologic indicators. Measurement of chemical properties provides a measurement of selected compounds at one point in time and does not show the impact of potential changes in the overall aquatic environment. The organisms that live in a stream are responding to their total environment. As fluctuations occur (due to changes in flow or chemical compounds), they are present. While some organisms have wide tolerances for change, others have very narrow tolerances, and as such, are excellent indicators that a change in water quality occurred, possibly a change in one or several substances not measured (thus not detectable) in the chemical monitoring. However, without chemical monitoring, the source of changes in aquatic systems cannot be identified. Both are needed: biologic monitoring to identify change, and chemical monitoring to identify what changed and attempt to locate its source or cause.

   The Park is not sufficiently equipped nor does it have sufficient personnel to do such monitoring with adequate accuracy. When RM-29 is funded, there will only be sufficient personnel, transportation, and equipment available for a HACH kit analysis of chemical properties at identified sites. More personnel and better equipment are needed to do an adequate job especially if wilderness legislation eliminates use of the helicopter for backcountry sampling.

4. WHAT HAS BEEN DONE: Some chemical water quality baseline information has been initiated by USGS with NPS support. Implementation of RM-27 will provide for more frequent measurements, but possibly with less adequate equipment.

5. DESCRIPTION OF WORK TO BE UNDERTAKEN: A water quality lab will be established in our existing building and chemical and biologic indicator of water quality will be accurately monitored at fixed stations throughout the Park. This information will not only be helpful for maintaining natural systems, but it will help the Park comply with the Federal Water Pollution Control Amendments of 1972 (PL 92-500) the Clean Water Act of 1977 (PL 95-217), the Service Memorandum of Understanding with EPA for interagency coordination of water quality management. Additionally, the monitoring will help the Park readily detect waters that may be unfit for consumption so that hikers in those areas may be advised accordingly.

6. LENGTH OF TIME NEEDED: This is a continuing project.

7. WHAT WILL HAPPEN IF PROJECT NOT UNDERTAKEN: The Park will not have good accurate data for monitoring and detecting degradation in water quality or for identifying sources, either internal or external. The Park will only be able to monitor chemical properties and then with only the accuracy of a portable lab (HACH kit or similar product).

8. WHAT ARE THE ALTERNATIVES: The Park could collect field samples and send them out for analysis. Some samples can be adequately preserved for accurate measurements, others cannot. The interval between collection and reporting of results would be the difference of several hours to several days to process samples in the Park compared to several weeks to several months to process samples sent away. The cost difference is significant and for long term monitoring it will be much cheaper for the Parks to have its own lab. The Park would be able to run more samples, do it at less cost per sample, and assure its own quality control.

9. PERSONNEL: Three additional technicians will be hired, one technician to process samples and maintain the lab, two technicians to collect samples and do field analysis where necessary. These would be additional to those hired for RM-29.

10. ADMINISTRATION AND LOGISTICS: This program will be administered by the Chief of Resources Management in cooperation with the Chief of Park Maintenance.

FUNDING

	Year in Program Sequence				
	1st	2nd	3rd	4th	5th
Personal Services				$19,700	$21,100
Other than Personal Services				$26,700	$ 5,300
Grand Total				$46,400	$26,400

Funds available in Park Base: None.

Funds requested from Regional Office: $46,400 first year; $26,400 second year.

11. REFERENCES AND CONTACTS:

a. Bancroft, William L., Chief of Resources Management, Sequoia and Kings Canyon National Parks.

b. Bradford, Wesley, USGS.

c. Werner, Harold, Fish and Wildlife Specialist, Sequoia and Kings Canyon National Parks.

12. DATE OF SUBMISSION: June, 1981

NATURAL RESOURCES PROJECT STATEMENT

1. PARK AND REGION: Sequoia and Kings Canyon National Parks; Western Region.

2. PROJECT NAME AND NUMBER: Giant Sequoia Restoration; RM-35

3. STATEMENT OF PROBLEM: Primarily because of fire suppression, vegetative composition has been unnaturally altered and fuels greatly increased in giant sequoia groves at Grant Grove and Giant Forest. Trees such as white fir *(Abies concolor)*, sugar pine *(Pinus lambertiana)*, and incense cedar *(Libocedrus decurrens)* have increased in total number. The heavy fuel and litter buildup have virtually buried the mineral soil seed bed needed by giant sequoia for germination. If these conditions are allowed to continue, giant sequoia will be replaced by more shade tolerant trees. The heavy fuel conditions could result in a crown fire in the groves, killing many giant sequoia.

4. WHAT HAS BEEN DONE: A prescribed burning research program was started in the Redwood Mountain Grove in 1969 to reintroduce fire back into the giant sequoia ecosystem. This program was expanded in 1979 upon the implementation of a new Fire Management Plan to other groves. Additionally, various youth groups, such as the Youth Conservation Corps, have removed the unnatural intrusion of understory trees by cutting, piling, and burning. From 1973 through 1979, about 15 acres of the 154 acre General Grant Tree area were treated.

5. DESCRIPTION OF WORK TO BE UNDERTAKEN: Prescribed fire will continue to be the fire management tool to restore natural conditions to all Sequoia Groves. In addition to using prescribed fire, about 100 acres, particularly in the vicinity of the Grant Tree and General Sherman Tree, will be treated by understory cutting, piling, and burning. A plan for restoring the General Grant Tree area was prepared in 1980. This Plan will be implemented this year by ranger personnel with support from the Resources Management Division. These funds requested will support the rangers in restoration of the area.

6. LENGTH OF TIME NEEDED: Five to 10 years.

7. WHAT WILL HAPPEN IF PROJECT NOT UNDERTAKEN: Giant sequoia regeneration will be virtually eliminated becuase of a lack of mineral seed bed. It will eventually disappear from the ecosystem. The loss could occur earlier by a wildfire supported by the unnaturally heavy fuel and tree buildup.

8. WHAT ARE THE ALTERNATIVES:

   a. Do no restoration and suppress all fires.

   b. Use prescribed fire only to restore natural conditions. Dead trees will be visible for many years.

c. Allow fire to burn, thus treatening visitors, mature sequoia, and facilities.

9. PERSONNEL: Two temporary Park Technicians, IGS-5, and a 10-15 person labor crew (YCC or CCC) will be used to accomplish the program.

10. ADMINISTRATION AND LOGISTICS: Supervision is provided by the Chief of Resources Management, and Forestry Technician.

FUNDING

	Year in Program Sequence				
	1st	2nd	3rd	4th	5th
Personal Services				$11,000	$11,000
Other than Personal Services				$ 1,000	$ 1,000
Grand Total				$12,000	$12,000

Funds available in Park Base: None

Funds requested from Regional Office: $12,000.

11. REFERENCES AND CONTACTS:

a. National Park Service, 1979. Sequoia and Kings Canyon Fire Management Plan. Kauper, Deborah, N. Stephenson, and T. Warner, 1980. The effect of past management actions on the composition and structure of vegetation in the Grant Tree portion of Grant Grove, Kings Canyon National Park, California. Unpublished Resources Management report 161 pp.

b. Warner, Thomas, Forestry Technician, Sequoia and Kings Canyon National Parks.

12. DATE OF SUBMISSION: June, 1981

NATURAL RESOURCES PROJECT STATEMENT

1. PARK AND REGION: Sequoia and Kings Canyon National Parks; Western Region.

2. PROJECT NAME AND NUMBER: Reintroduction of Bighorn Sheep to the Great Western Divide. RM-36.

3. STATEMENT OF THE PROBLEM: In the 1870's, herds of bighorn sheep estimated at 50 to 75 head were observed on the Great Western Divide in the Sawtooth Peak-Farewell Gap region. Other herds occurred along the crest of the Sierra. The herds rapidly declined during the first half of the 20th century. This appears to have been caused largely by competition and diseases from domestic sheep, and many of the bighorn were shot for meat. Today there are no known herds on the Great Western Divide and only two of the original herds remain on the Sierra Crest; the Mt. Baxter herd of about 180-200, and the Mt. Williamson herd of about 30.

4. WHAT HAS BEEN DONE: The California Department of Fish and Game (CDFG), working cooperatively with the Inyo National Forest (INF) took 40 sheep total from the Mt. Baxter herd during 1979 and 1980 for reintroduction to Mt. Langley (10 head), Whaler Ridge (20 head), and Mt. Warner (10 head). The individuals on Wheeler Ridge are reported to be doing well, though many of the sheep taken to Mt. Langley were killed by preditors. A preliminary aircraft survey of the Great Western Divide by John Wehausen and David Graber indicated potential reintroduction sites between Laurel Creek and Kaweah Peaks Ridge.

5. DESCRIPTION OF WORK TO UNDERTAKEN: A thorough survey of potential reintroduction sites needs to be completed. A plan needs to be developed for the reintroduction, monitoring, and management of the heard. The reintroduction, monitoring, and management of the herd. The reintroduction will be an interagency project involving the CDFG AND INF. The project will involve a minimum of 30 to 40 head per reintroduction site and will be dependant on the vitality of the Mt. Baxter herd.

6. LENGTH OF TIME NEEDED: The reintroduction will require one spring season per site. Beyond the initial intensive monitoring that will be done by research personnel, an annual census of the herd will be a continuing program.

7. WHAT WILL HAPPEN IF PROJECT NOT UNDERTAKEN: A major high elevation ungulate will continue to be absent on its former range on the Great Western Divide. Since only one thriving herd exists, the race is very vulnerable to possible extinction caused by disease. The sooner more populations are established, the greater the chances of the race surviving. Bighorn sheep

do not normally expand into new areas on their own, particularly when they would have to cross poor habitat to get there.

8. WHAT ARE THE ALTERNATIVES: The Parks could assume that they may eventually move back onto the Great Western Divide on their own. However, this could take centuries, or may never happen.

9. PERSONNEL: One temporary Park Technician,IGS-5, will be added to the Parks' staff.

10. ADMINISTRATION AND LOGISTICS: Studying potential reintroduction sites and initial monitoring of the herd(s) will be conducted by the Wildlife Scientist (N-22). The reintroduction and long term monitoring will be administered by the Fish and Wildlife Specialist.

FUNDING

	Year in Program Sequence				
	1st	2nd	3rd	4th	5th
Personal Services				$59,200	$59,200
Other than Personal Services				$14,800	$14,800
Grand Total				$74,000	$74,000

Funds available in Park Base: None

Funds required from Regional Office: $42,000 for the reintroduction and and additional $32,000 in the Parks' base for monitoring.

11. REFERENCES AND CONTACTS:

a. Blankinship, Tom, CDFG

b. Graber, David, Wildlife Biologist, Sequoia and Kings Canyon National Parks, Three Rivers, CA. 93271

c. Weaver, Dick, CDFG

d. Werner, Harold, Fish and Wildlife Specialist, Sequoia and Kings Canyon National Parks, Three Rivers, CA. 93271

12. DATE OF SUBMISSION: June, 1981

NATURAL RESOURCES PROJECT STATEMENT

1. PARK AND REGION: Sequoia and Kings Canyon National Parks; Western Region.

2. PROJECT NAME AND NUMBER: Long-term Monitoring of Management Impacts on Natural Communities, RM-37.

3. STATEMENT OF PROBLEM: Because of limited funding, management studies are normally directed toward the most conspicuous, legislatively mandated, or socio-politically sensitive problems. Though these problems are often of great ecological significance, sometimes they are not, and rarely are they concerned with entire communities.

   The resources of these Parks were set aside as a Biosphere Reserve. Yet not only is a complete inventory of those resources lacking, but we have little knowledge of how past and present management is affecting those resources. Though we have concerned ourselves with management impacts on bear, deer, tree hazards, rare organisms, beaver, etc., the studies generally look at portions and not whole communities. The fire studies probably come closer to achieving a community approach than most other studies. The long-term effect of current management practices on community structure, or even on the most abundant fauna, is largely unknown.

4. WHAT HAS BEEN DONE: As a true interdisciplinary comprehensive community study, nothing has been done.

5. DESCRIPTION OF WORK TO BE UNDERTAKEN: Grided management evaluation plots (MEP) will be established in each of the major communities within these Parks to document long-term changes in community composition and attempt to document how observed changes (or lack of them) are influenced by management practices (fire, campgrounds, trail head quotas, construction, etc.). The data will be collected by interdisciplinary teams of personnel knowledgeable in sampling, flora, vertebrates, invertebrates, soil, water, and weather. Several MEP would be surveyed each year with each MEP being surveyed at about 10 year intervals.

6. LENGTH OF TIME NEEDED: This is a continuing project.

7. WHAT WILL HAPPEN IF PROJECT IS NOT UNDERTAKEN: These Parks will continue to manage with little feedback on the effects of existing management on overall park resources.

8. WHAT ARE THE ALTERNATIVES: Continue to manage without this information.

9. PERSONNEL: Four temporary Park Technicians, GS-5, and two subject to furlough Biological Technicians, GS-7/9, will be added to the Parks' staff.

10. ADMINISTRATION AND LOGISTICS: Vegetation, soil, and weather aspects will be administered by the Vegetation Management specialist. Vertebrate, invertebrate, and aquatic aspects will be administered by the Fish and Wildlife Specialist.

FUNDING

	Year in Program Sequence				
	1st	2nd	3rd	4th	5th
Personal Services				$53,800	$53,800
Other than Personal Services				$13,400	$13,400
Grand Total				$67,200	$67,200

Funds available in Park Base: None

Funds requested from Regional Office: $67,200 per year

11. REFERENCES AND CONTACTS

a. Parsons, David, Research Scientist, Sequoia and Kings Canyon National Parks, Three Rivers, CA. 93271

b. Werner, Harold, Fish and Wildlife Specialist, Sequoia and Kings Canyon National Parks, Three Rivers, CA. 93271

12. DATE OF SUBMISSION: June, 1981

NATURAL RESOURCES PROJECT STATEMENT

1. PARK AND REGION: Sequoia and Kings Canyon National Parks; Western Region.

2. PROJECT NAME AND NUMBER: Monitor and Evaluate Ozone Injury on Vegetation RM-38.

3. STATEMENT OF PROBLEM: This would be an extension of an existing Forest Service project to Park Service land and assistance in setting up the sampling system, evaluation of sampling accuracy, and data analysis would be provided by the Forest Service. This project proposal would provide for Park Service personnel to establish and monitor approximately 125 permanent 0.6 acre of ozone injury plots which could also be eventually used to monitor other natural and man-caused impacts to the vegetation. Ozone injury symptoms were first detected in the southern Sierra Nevada in 1969. Since then, ozone concentrations exceeding both State and Federal standards have been measured in the Parks, but only limited vegetation damage monitoring has been done; most of the available data comes from adjacent National Forests. If funded, this project would provide for the first intensive assessment of ozone damage in the Parks.

4. WHAT HAS BEEN DONE: While ozone concentrations have been monitored in the Parks in the past (1974, 1977, and 1979) only limited data on ozone injury to vegetation exists. Most available data comes from plots on adjacent National Forests.

5. DESCRIPTION OF WORK TO BE UNDERTAKEN: Approximately 125 ozone injury plots will be established and monitored throughout the Parks in the 4,000 to 8,000 foot elevation range. This will enable the Park Service to evaluate the effects of monitored concentrations of ozone on vegetation. These plots will be monitored periodically to detect any changes in impact.

6. LENGTH OF TIME NEEDED: This is a continuing project.

7. WHAT WILL HAPPEN IF PROJECT NOT UNDERTAKEN: The Park Service will continue to have to rely on data from Forest Service lands, which may or may not be applicable to the Parks. In other words, the Parks will have no actual data on the impact of air pollution on the Parks' resources.

8. WHAT ARE THE ALTERNATIVES :

   a. Do not monitor ozone impacts.

   b. Monitor ozone at level proposed.

9. PERSONNEL: Two temporary Forestry Technicians, IGS-5, will be added to the Park staff.

10. ADMINISTRATION AND LOGISTICS: Supervision will be carried out by the Chief of Resources Management.

FUNDING

	Year in Program Sequence				
	1st	2nd	3rd	4th	5th
Personal Services				$6,500	$6,500
Other than Personal Services				$1,600	$1,600
Grant Total				$8,100	$8,100

Funds available in Park Base: None.

Funds requested from Regional Office: $8,100

11. REFERENCES AND CONTACTS:

a. Pronos, John, Detlev R. Vogler, and Richard S. Smith, Jr. 1978. An evaluation of ozone injury to pines in the southern Sierra Nevada. Forest Insect and Disease Management, Region 5, U.S. Forest Service Report No. 78-1. 10 pp.

b. Williams, Wayne T., Michael Brady, and Steven Willison. 1977. Air pollution damage to forest trees in the Sequoia National Forest, Sequoia and Kings Canyon National Parks, California. Jr. of Air Pollution Control Assoc. 27:230-234.

12. DATE OF SUBMISSION: June, 1981.

NATURAL RESOURCES PROJECT STATEMENT

1. PARK AND REGION: Sequoia and Kings Canyon National Parks; Western Region.

2. PROJECT NAME AND NUMBER: Vista Clearing; RM-39.

3. STATEMENT OF PROBLEM: Because of the absence of natural fire and road construction, many vistas have been blocked by the encroaching forests. Several roadside views have also been blocked creating a drive through a monotonous cooridor of trees. Vistas are needed to provide a better view of the Park scenery to the Park visitor. An estimated 750 trees in the 4-8" size classes and many seedlings need to be removed, once the trees are removed, prescribed burning will be used to maintain the vistas.

4. WHAT HAS BEEN DONE: A limited number of trees were removed along the Generals Highway in the Giant Forest area in 1968.

5. LENGTH OF TIME NEEDED: Five years to cut proposed vistas. Fire will be used every three to four years after that to maintain the vistas.

6. DESCRIPTION OF WORK TO BE UNDERTAKEN: Exact location of vistas, their extent and design, the marking, felling, and removing of individual trees will be accomplished.

7. WHAT WILL HAPPEN IF PROJECT NOT UNDERTAKEN: The natural resources of the Park will continue to be hidden from view. A monotonous corridor of dense vegetation, which permits little opportunity to view the Park scenery will exist.

8. WHAT ARE THE ALTERNATIVES:

   a. Do not clear vistas.

   b. Clear only a selected number of vistas.

9. PERSONNEL: Two temporary Sawyers/Woodsworker, WG-5, will be added to the Park staff.

10. ADMINISTRATION AND LOGISTICS: The program will be under the supervision of the Chief of Resources Management. Trees will be marked and felled by Resources Management crews and sold to a logging contractor.

FUNDING

	Year in Program Sequence				
	1st	2nd	3rd	4th	5th
Personal Services					$21,000
Other than Personal Services					$ 2,000
Grand Total					$23,000

Funds available in Park Base: None.

Funds requested from Regional Office: $23,000.

11. REFERENCES AND CONTACTS: None.

12. DATE OF SUBMISSION: June, 1981.

NATURAL SCIENCE PROJECT STATEMENT

1. PARK AND REGION: Sequoia and Kings Canyon National Parks; Western Region.

2. PROJECT NAME AND NUMBER: Research on the Status of the Endangered California Condor, Peregrine Falcon, and Bald Eagle; N-7.

3. STATEMENT OF PROBLEM: Three endangered species, the California Condor, the Peregrine Falcon, and the Bald Eagle, are known to occur within Sequoia and Kings Canyon National Parks. We are legally obligated to learn the status of these species, particularly their distribution, habits, and abundance. Areas of potential habitat need to be identified for future monitoring. The Endangered Species Act of 1973 has mandated ". . . that all Federal departments and agencies shall seek to conserve endangered species and threatened species and shall utilize their authorities in furtherance of the purposes of this Act." The National Park Service Management Policies of 1975 specifies, "The Service will identify all threatened and endangered species within the park boundaries and their habitat requirements."

4. WHAT HAS BEEN DONE: No comprehensive studies have been conducted on these three endangered species in Sequoia and Kings Canyon National Parks. A preliminary feasibility study will be carried out by Park staff during 1981.

5. DESCRIPTION OF THE WORK TO BE UNDERTAKEN: The distribution, abundance, habitat, conditions and requirements of these species will be identified by subjective and systematic searches. The objectives of this study will be:

   1. To determine the status of the California Condor, Peregrine Falcon, and the Bald Eagle within the Parks.

   2. To designate existing and suitable Peregrine Falcon nesting habitat.

   3. To designate existing and suitable California Condor nesting, foraging, and roosting habitat.

   4. To identify and designate Bald Eagle roosting and/or foraging habitat.

   5. To provide Parks management with methods for monitoring Bald Eagle, Peregrine Falcon, and California Condor populations in the future.

   6. To recommend management actions that would protect these species if found, from artificial hazards.

6. LENGTH OF TIME NEEDED: The study will be conducted over a two year period of time.

7. WHAT WILL HAPPEN IF PROJECT NOT UNDERTAKEN: If not undertaken, we will continue to have little or no knowledge necessary to protect those endangered species found within the Parks. We will also fail to comply with the Endangered Species Act and the National Park Service Management Policies.

8. WHAT ARE THE ALTERNATIVES:

   a. No action.

   b. Fund project at request level.

9. PERSONNEL: The study may most efficiently be accomplished by contracting with university scientists, especially through the CPSU/UCD, or hiring two Biological Technicians (temporary).

10. ADMINISTRATION AND LOGISTICS: The project will be conducted under the overall direction of the Research/Wildlife Scientist.

    FUNDING

	Year in Program Sequence				
	1st	2nd	3rd	4th	5th
Personal Services	$13,500	$14,000			
Other than Personal Services	$ 9,000	$ 6,500			
Grand Total	$22,500	$20,500			

Funds available in Park Base: None

Funds requested from Regional Office: $22,500 1st year - $20,500 2nd year

Total in two years $43,000

11. REFERENCES AND CONTACTS:

   a. Mike Coffey, Wildlife Biologist, Sequoia and Kings Canyon National Parks.

   b. Charles van Riper, CPSU-UCD, Davis, CA. 95616

12. DATE OF SUBMISSION: June, 1981.

NATURAL SCIENCE PROJECT STATEMENT

1. PARK AND REGION: Sequoia and Kings Canyon National Parks; Western Region.

2. PROJECT NAME AND NUMBER: Fire Dynamics of Subalpine Forest Types; N-8.

3. STATEMENT OF PROBLEM: Little is known of the history or dynamics of fire in the Parks upper mixed-conifer and subalpine forest communities nor of the extent to which recent fire suppression has effected these ecosystems. Burning prescriptions need to be developed for the different upper mixed-conifer forest types in order to most effectively provide for the reintroduction of fire. Investigation of the ecology and character of fire in pure lodgepole pine stands, and catastrophic fire in the lodgepole-subalpine belt needs special attention. The latter may effect management of adjacent forest types as well as the Parks boundary, and possibly that by adjacent land management agencies.

4. WHAT HAS BEEN DONE: Study of the behavior and ecological implications of fire in the Parks red fir ecosystems was initiated by Kilgore in the late 1960's. This study was never fully developed. While some recent fire history data is available, no comprehensive study has yet to be conducted on the dynamics of fire in the lodgepole-subalpine ecosystems of the southern Sierra Nevada.

5. DESCRIPTION OF WORK TO BE UNDERTAKEN: The impact of fire suppression (changes in forest composition and structure, soils, wildlife ecology, etc.) needs to be determined for the upper mixed-conifer and lodgepole-subalpine ecosystems. Fire frequencies, sizes, and intensities prior to influence by European man will be investigated for each major component of these communities. The extent to which factors such as slope, aspect, and topographic features affect fire frequency and behavior also will be evaluated.

   Past fire history as well as present fuel loading and species composition will be inventoried and mapped for each of the upper mixed-conifer, lodgepole, and subalpine forest types. Fire behavior relative to fuel loading, topography, and fire weather conditions will be quantified as input for the development of prescriptions for refining the fire management program. Attempts will be made to identify potential "routes" of catastrophic fire for inclusion in Park and interagency management and contingency plans.

6. LENGTH OF TIME NEEDED: Studies and inventories will be conducted over a three year period.

7. WHAT WILL HAPPEN IF PROJECT NOT UNDERTAKEN: Fires will continue to be suppressed in the upper mixed-conifer belt, amplifying the magnitude of man-caused changes in the ecosystems, and increasing the potential for serious wildfire. Populations dependent in part upon fire may disappear. In the higher elevations, the Parks natural fire management program will proceed without specific knowledge of its long term impact.

8. WHAT ARE THE ALTERNATIVES:

   a. No action.

   b. Determine the fire dynamics of subalpine forests.

9. PERSONNEL: This study will be conducted primarily in-house.

10. ADMINISTRATION AND LOGISTICS: Responsibility for administering the project will be shared by the Research Scientist, and the Chief of Resources Management.

FUNDING

	Year in Program Sequence				
	1st	2nd	3rd	4th	5th
Personal Services			$11,000	$11,000	$11,000
Other than Personal Services			$ 7,000	$ 7,000	$ 7,000
Grand Total			$18,000	$18,000	$18,000

Funds available in Park Base: None.

Funds requested from Regional Office: $18,000 each year for three years.

11. REFERENCES AND CONTACTS:

   a. Bancroft, William L., Chief of Resources Management, Sequoia and Kings Canyon National Parks.

   b. Kilgore, B. M. 1971. The role of fire in managing red fir forests. Trans. 36th North Amer. Wildlife and Nat. Res. Conf. pp. 405-416

   c. Kilgore, B. M. and G. S. Briggs. 1972. Restoring Fire to high elevation forests in California. J. Forestry, 70(5):266-271.

d. Rundel, P. W., D. J. Parsons, and D. T. Gordon. 1977. Montane and subalpine vegetation of the Sierra Nevada and Cascade ranges. In M. Barbour and J. Majors (Editors), Terrestrial Vegetation of California. John Wiley and Sons. pp. 559-599.

12. DATE OF SUBMISSION: June, 1981

NATURAL SCIENCE PROJECT STATEMENT

1. PARK AND REGION: Sequoia and Kings Canyon National Parks; Western Region.

2. PROJECT NAME AND NUMBER: Ecological Role of Smoke From Fire Management Program; N-10.

3. STATEMENT OF PROBLEM: With the reintroduction of fire into its natural role in the environment through the programs of prescribed burning and allowing fires to burn naturally, it has become essential to give careful consideration to possible impacts of smoke emmissions. State laws now restrict the time and conditions under which such fires are allowed to burn. It is thus necessary to increase our understanding of the potential effects of wood smoke from fires of different types (intensity and vegetation types) on various aspects of the environment. Past studies have indicated that smoke may have a significant effect on forest pathogens. If this can be documented, it may provide a valuable tool for controlling forest disease organisms as well as provide additional justification for the Parks fire management program.

4. WHAT HAS BEEN DONE: To date, little attempt has been made to study the effects of smoke from the Parks burning programs on other aspects of the environment. Exploratory studies by Dr. J. R. Parmeter provide some indication that wood smoke may help to control *Fomes annosus*, a fungal pathogen of coniferous trees.

5. DESCRIPTION OF WORK TO BE UNDERTAKEN: A preliminary survey of the available literature on past and ongoing research on the effects of burning on atmospheric pollution and possible environmental degradation or benefits from smoke will be conducted. Effects will be made to relate such efforts to the fire management programs in these Parks. Standard techniques will be formulated to monitor smoke emissions from both natural and prescribed fires in an effort to increase our understanding of the effects of prescription, fire intensity, time of year, and vegetation type on smoke emissions and their subsequent ecological impact. In addition, studies will be made of the possible impact of wood smoke on controlling *Fomes annosus* and other forest disease organisms.

6. LENGTH OF TIME NEEDED: The studies will be conducted over a three year period.

7. WHAT WILL HAPPEN IF PROJECT NOT UNDERTAKEN: If this study is not undertaken, we will continue to have an incomplete understanding of the effects of the smoke produced from fire management programs in the Parks on other aspects of the environment. We will risk not having sufficient information to justify approval of future burning by local and State agencies. We

will also risk not understanding how fire might serve as an important controller of forest disease organisms.

8. WHAT ARE THE ALTERNATIVES:

   a. No action.

   b. Implement proposal.

   c. Conduct literature research only.

9. PERSONNEL: The study will be primarily conducted under contract by university based scientists.

10. ADMINISTRATION AND LOGISTICS: The study will necessarily be coordinated closely with the fire management program of the Parks and will be under the general guidance of the Research Scientist and the Chief of Resources Management.

FUNDING

	Year in Program Sequence				
	1st	2nd	3rd	4th	5th
Personal Services			$ 3,500	$ 3,500	$ 3,500
Other than Personal Services			$14,500	$14,500	$14,500
Grand Total			$18,000	$18,000	$18,000

Funds available in Park Base: None

Funds requested from Regional Office: $18,000 for each of three years.

11. REFERENCES AND CONTACTS:

   a. Hall, J. A. 1972. Forest fuels, prescribed fire, and air quality, U.S. Forest Service PNW Re. Paper, Portland, Oregon.

   b. Parmeter, J. R., Department of Plant Pathology, University of California Berkeley, California 94720.

12. DATE OF SUBMISSION: June, 1981

NATURAL SCIENCE PROJECT STATEMENT

1. PARK AND REGION: Sequoia and Kings Canyon National Parks; Western Region.

2. PROJECT NAME AND NUMBER: Management Impacts on Deer; N-11.

3. STATEMENT OF PROBLEM: While deer populations have generally declined throughout the western United States, we do not know if this is true under the protected conditions of these Parks. Mineral King, formerly a game refuge and traditional deer hunting area, is now a part of Sequoia National Park. Local sporting groups and the State Department of Fish and Game have expressed great concern that the Park Service will not monitor and manage the herd properly. Secondly, planned prescribed burning programs in chaparral and oak woodland may alter drastically deer habitat in extensive areas of Sequoia. Loss of food and cover, followed by possible great increases in available deer forage, could have a dramatic effect on deer numbers and the resources upon which they have impact.

4. WHAT HAS BEEN DONE: Occasional estimates of population size and doe/buck ratios have been made by Park personnel. In the past, control activities to reduce population size have also been taken.

5. DESCRIPTION OF THE WORK TO BE UNDERTAKEN: Information on population size, migration patterns, habitat utilization, and habitat condition will be collected for several areas. Plots will compare deer parameters and habitat over time, especially comparing pre- versus post-treatment (fire). Exclosures will measure the impact of deer on vegetation. Some animals will be fitted with radio collars to study individual movements and migration.

6. LENGTH OF TIME NEEDED: The study is anticipated to cover a three-year period.

7. WHAT WILL HAPPEN IF PROJECT NOT UNDERTAKEN: The Parks will not be able to respond to public queries about our deer population. A substantial management action will be initiated with no baseline data to measure its impact on fauna. There will be no basis upon which to predict future changes in population size, the impact of future management actions on deer, and the impact of deer herd on vegetative resources.

8. WHAT ARE THE ALTERNATIVES:

   a. No action.

   b. Fund program at desired level.

9. PERSONNEL: The study can best be conducted under the direction of the Research Scientist by seasonal technicians, in consultation with the Fish and Wildlife Specialist.

10. ADMINISTRATION AND LOGISTICS: The study will be conducted in Sequoia National Park under the joint administration of the Research Scientist, and the Fish and Wildlife Specialist.

FUNDING

	Year in Program Sequence				
	1st	2nd	3rd	4th	5th
Personal Services			$12,000	$12,000	
Other than Personal Services			$ 4,000	$ 4,000	
Grand Total			$16,000	$16,000	

Funds available: None

Funds requested from Regional Office: $16,000 for each of two years.

11. REFERENCES AND CONTACTS:

a. Keay, Jeffrey, Fish and Wildlife Biologist, Yosemite National Parks, Yosemite, California 95389

b. Salwasser, Hal, Tahoe National Forest, Nevada City, CA. 95959

c. Werner, Harold, Fish and Wildlife Biologist, Sequoia and Kings Canyon National Parks, Three Rivers, CA. 93271

12. DATE OF SUBMISSION: June, 1981

NATURAL SCIENCE PROJECT STATEMENT

1. PARK AND REGION: Sequoia and Kings Canyon National Parks; Western Region.

2. PROJECT NAME AND NUMBER: Fire Ecology/Biology of Endangered and Threatened Plants; N-13.

3. STATEMENT OF PROBLEM: Approximately 20 species of plants found within Sequoia and Kings Canyon National Parks have been proposed for Federal classification as Endangered or Threatened. Such classification requires that the managing agency identify and take the necessary steps to protect all populations. While efforts are underway to inventory the distribution and status of all proposed species in the Parks, almost nothing is known about the biology of any of these species. The expansion of the Parks fire management program as well as possible threats from visitor use and other management actions make it essential to understand how such activities impact the subject species.

4. WHAT HAS BEEN DONE: The California Native Plant Society has compiled and mapped all known collections of proposed threatened and endangered plants in the State. Copies of those maps, which include portions of Sequoia and Kings Canyon National Parks, are now in Park files. Field surveys are underway to identify the distribution and status of the approximately 20 Park species in this category. No species-specific studies have been conducted to evaluate the effects of fire or other management action on any of these species.

5. DESCRIPTION OF WORK TO BE UNDERTAKEN: Those species that have been proposed for threatened or endangered classification will be prioritized and species-specific studies undertaken on the top priorities to evaluate the effects of fire (or fire suppression), visitor use and other management actions on them. Available information from other sources will be utilized to the extent possible. Studies will focus on threats to species distribution and status, reproduction biology and fire adaptations.

6. LENGTH OF TIME NEEDED: This work will be carried out over a three year period of time.

7. WHAT WILL HAPPEN IF PROJECT NOT UNDERTAKEN: If this study is not conducted, we risk allowing certain rare plant species to go extinct as a result of adverse Park management actions or visitor use patterns. This directly violates State and Federal laws.

8. WHAT ARE THE ALTERNATIVES: Due to the need to comply with the Endangered Species Act, there are no realistic alternatives.

9. PERSONNEL: The study will be conducted by either Park personnel or under contract, depending on which way the most qualified investigators can be found.

10. ADMINISTRATION AND LOGISTICS: The study will necessitate extensive field work, much of it in the Parks backcountry. It will be administered by the Research Scientist.

FUNDING

	Year in Program Sequence				
	1st	2nd	3rd	4th	5th
Personal Services		$11,500	$12,000	$12,000	$12,000
Other than Personal Services		$ 4,500	$ 4,000	$ 4,000	$ 4,000
Grand Total		$16,000	$16,000	$16,000	$16,000

Funds available in Park Base: None

Funds requested from Regional Office: $16,000 for each of four years.

11. REFERENCES AND CONTACTS:

a. California Native Plant Society, Davis, California 95616

b. Norris, Larry,Seasonal Technician, Sequoia and Kings Canyon National Parks.

c. Shevock, James, Plant Ecologist, Sequoia National Forest, Porterville, California 93257

12. DATE OF SUBMISSION: June, 1981

NATURAL SCIENCE PROJECT STATEMENT

1. PARK AND REGION: Sequoia and Kings Canyon National Parks; Western Region.

2. PROJECT NAME AND NUMBER: Data Storage/Retrieval System; N-14

3. STATEMENT OF PROBLEM: The existing data base of the Parks natural resources is not readily retrievable. Data on plant, animal, geological, and other resources is scattered through numerous files and collections. There is no systematic way to revrieve data on a specific organism or community type when a need arises. It is thus important that an information data system be designed to meet future management needs. Without such a system it has become increasingly difficult to conduct efficient planning activities for the Parks.

4. WHAT HAS BEEN DONE: No action has been taken in this area.

5. DESCRIPTION OF WORK TO BE UNDERTAKEN: A computerized system for storage and retrieval of all kinds of basic information of the plant, aquatic, and geological resources will be developed. This will greatly facilitate the analysis of possible ecological impacts in any future planning efforts. A thorough evaluation and summary of all existing resources information will be made and the pertinent data incorporated into the new system. The appropriate computer hardware will be purchased by the Parks to facilitate the storage and retrievable function.

6. LENGTH OF TIME NEEDED: The study will be conducted over a three year period.

7. WHAT WILL HAPPEN IF PROJECT NOT UNDERTAKEN: If the study is not conducted, we will continue to lack any organized summary of the various types of natural resources information available to the Parks. Inability to easily retrieve such information and synthesize for combined past data will greatly hamper various planning efforts. Management errors might logically follow with associated undesirable changes or damage to natural resources.

8. WHAT ARE THE ALTERNATIVES:

   a. No action.

   b. Implement proposal.

9. PERSONNEL: The study may be partially contracted out or done inhouse as appropriate at the time.

10. ADMINISTRATION AND LOGISTICS : The study will be coordinated by both the Research Scientist and the Chief of Resources Management.

FUNDING

	Year in Program Sequence				
	1st	2nd	3rd	4th	5th
Personal Services			$20,000	$20,000	$20,000
Other than Personal Services			$18,000	$18,000	$18,000
Grand Total			$38,000	$38,000	$38,000

Funds available in Park Base: None.

Funds requested from Regional Office: $38,000 for each of three years.

11. REFERENCES AND CONTACTS

a. Kessell, Steven, Gradient Modeling Inc., Missoula, Montana 59801

12. DATE OF SUBMISSION: June, 1981

NATURAL SCIENCE PROJECT STATEMENT

1. PARK AND REGION: Sequoia and Kings Canyon National Parks; Western Region.

2. PROJECT NAME AND NUMBER: Fire Ecology of Foothill Woodland Communities; N-15.

3. STATEMENT OF PROBLEM: The Parks' fire management program is now expanding into the low elevation foothills. To date, no information is available on the historical role of fire in the woodland communities. Both the foothill woodland and mixed evergreen woodland communities have experienced 50 years or more of fire suppression. It is not known what role fire previously played in the maintenance of these community types and thus with what frequency and intensity Park managers should reintroduce fire through prescribed burning. Similarly, little is known about the effects of weather, species composition and structure, fuel loading or fire type on fire behavior or effects on these communities. This knowledge is essential if these ecosystems are to be preserved as naturally functioning communities.

4. WHAT HAS BEEN DONE: Almost no information is available on the fire history and ecology of the foothill woodland communities.

5. DESCRIPTION OF THE WORK TO BE UNDERTAKEN: The proposed study will investigate the historical frequency and role of fire in both the mesic mixed evergreen and foothill woodland communities. In addition to basic ecological descriptions, attention will be focused on the effects of burning (by season and intensity) on the dominant species of both plants and animals. Experimental prescribed burns will be set under varying conditions. Post-burn monitoring of species succession, diversity, nutrient cycling and community boundaries will be carried out. Burning prescriptions will be tested to assure safe burning conditions for an expanded fire management program. Past fire frequency will be evaluated by sampling (cores and wedges) fire scarred trees found throughout t he foothill zone. Finally, efforts will be made to expand preliminary studies on the effects of fire on the native grasses which once dominated the area but are now only rarely encountered. The data collected from this study will be the first of its kind for these community types. It will be applicable to similar areas throughout the state.

6. LENGTH OF TIME NEEDED: The study will be carried out over a four year period.

7. WHAT WILL HAPPEN IF PROJECT NOT UNDERTAKEN: If this project is not carried out, the fire management program in the foothill zone will be conducted (in part because of urgent fuel hazard conditions) without full knowledge of the effects of the program on the vegetation and wildlife of the area. This could threaten the health and even survival of some of the communities for whose preservation these Parks were created.

8. WHAT ARE THE ALTERNATIVES:

   a. No action.

   b. Fund project at desired level.

9. PERSONNEL: The study will be coordinated and carried out by Park personnel.

10. ADMINISTRATION AND LOGISTICS: The work will be supervised by the Parks' two research scientists.

    FUNDING

	Year in Program Sequence				
	1st	2nd	3rd	4th	5th
Personal Services	$24,000	$24,000	$24,000	$24,000	$24,000
Other than Personal Services	$ 8,000	$ 8,000	$ 8,000	$ 8,000	$ 8,000
Grant Total	$32,000	$32,000	$32,000	$32,000	$32,000

    Funds available in Park Base: None

    Funds requested from Regional Office: $32,000 for each of four years.

11. REFERENCES AND CONTACTS:

    a. Bancroft, William L., Chief of Resources Management, Sequoia and Kings Canyon National Parks.

    b. Parsons, David J., Research Scientist, Sequoia and Kings Canyon National Parks.

c. Parsons, D. J. 1981. The historical role of fire in the foothill communities of Sequoia National Park. Madrono (in press).

12. DATE OF SUBMISSION: June, 1981

NATURAL SCIENCE PROJECT STATEMENT

1. PARK AND REGION: Sequoia and Kings Canyon National Parks; Western Region.

2. PROJECT NAME AND NUMBER: Preservation of Mountain Meadows; N-16.

3. STATEMENT OF PROBLEM: Conifers (especially lodgepole pine) and several species of willow have colonized substantial portions of some montane and subalpine meadows since establishment of these Parks. Pre-Park and more recent human activities (grazing, fire suppression, etc.) are generally agreed to have affected the rate and extent to which these invasions have progressed. However, it is thought that individual meadows respond differently to these influences due to their different histories and environments. In recent years, management activities, including the removal of lodgepole pine, have been suspended because of a lack in knowledge of the nature (origin, age structure, current rates of invasion) of these invasions into individual meadows. Before further action is taken, it is important to determine if historic invasions proceeded at different rates than are now occurring, and to what extent current and historic invasion is related to natural factors (climatic events, etc.) and/or human influences (use history) in individual meadows. Little is known about the ecology and dynamics of willow and other woody species in montane subalpine meadows.

4. WHAT HAS BEEN DONE: Meadows with significant lodgepole invasions have been identified. Age structure data is available for only one meadow, and it is as yet to be analyzed. A literature review on meadow invasion and the silvics of Pinus contorta var. murryana has been started.

5. DESCRIPTION OF WORK TO BE UNDERTAKEN: As a first step, potential study sites will be identified. Use of history and climatic flux (as indicated by snow survey and river flow records or a tree ring width chronology) will then be summarized for each meadow having significant lodgepole or willow invasion(s). The age structure and rates of invasion for individual colonies will be determined in each meadow. The success of past removal actions will be evaluated and recommendations made for management action based on the findings. If possible, further experimentation with different removal techniques will be evaluated. Biotic and adaphic characteristics of invaded areas will be recorded in order to enhance knowledge of the dynamics of invasion and develop a classification system for invasion types and prediction of future invasions. The possible interaction of shrub invasion and lodgepole invasion will be investigated.

6. LENGTH OF TIME NEEDED: The study will be conducted over a four year period, including at least three field seasons.

7. WHAT WILL HAPPEN IF PROJECT NOT UNDERTAKEN: If not funded, we run the risk of eventually losing many of the Parks' backcountry meadows. Substantial portions of Parks meadows may become more permanently entrenched as forest, reducing the potential for future reversal, and intensifying the effort and cost of possible future removal efforts. We will continue to avoid our responsibility to base management action (or lack of) on a scientific basis.

8. WHAT ARE THE ALTERNATIVES:

   a. No action.

   b. Implement the proposal.

9. PERSONNEL: Most of this study will be carried out by Park personnel. Subprojects may be contracted out.

10. ADMINISTRATION AND LOGISTICS: In-house personnel need to be highly mobile as the field work will carry them throughout the Parks. They will be directed by the Research Scientist.

FUNDING

	Year in Program Sequence			
1st	2nd	3rd	4th	5th
Personal Services	$15,000	$15,000	$15,000	$15,000
Other than Personal Services	$ 5,000	$ 5,000	$ 5,000	$ 5,000
Grand Total	$20,000	$20,000	$20,000	$20,000

Funds available in Park Base: None.

Funds requested from Regional Office: $20,000 for each of four years.

11. REFERENCES AND CONTACTS:

a. DeBenedetti, Steven H., Biological Technician, Sequoia and Kings Canyon National Parks.

b. Vale, T. R. 1978. Tree invasion of Cinnabar Park in Wyoming. Amer. Midl. Nat. 100(2):277-284.

c. Vankat, J. K. 1970. Vegetation change in Sequoia National Park, California. Ph.D. Thesis, U.C. Davis. 199 pp.

12. DATE OF SUBMISSION: June, 1981

NATURAL SCIENCE PROJECT STATEMENT

1. PARK AND REGION: Sequoia and Kings Canyon National Parks; Western Region.

2. PROJECT NAME AND NUMBER: Techniques for Rehabilitating Backcountry Impact; N-18.

3. STATEMENT OF PROBLEM: The effects of increasing numbers of visitors in the backcountry of the Parks can be seen in the form of heavily impacted campsites and trails. In many cases, campsites have been developed to the extent where they do not blend with the natural environment. In addition, many sites will be closed in future years due to their unacceptable location. Techniques are needed to reestablish natural vegetation, reduce soil compaction, remove soot from rocks and in general, return such campsites to a more natural condition. Similarly, many backcountry trails run through meadows or other soft vegetation. Wherever possible, these trails are being retouted out of the meadows. In such cases, techniques for rehabilitating old trail scars are badly needed.

4. WHAT HAS BEEN DONE: Some preliminary efforts have been made to experiment with different techniques of revegetating and restoring old trail scars through meadows. These studies provide preliminary guidelines for a more in depth quantitative evaluation of this problem.

5. DESCRIPTION OF WORK TO BE DONE: A literature review of techniques utilized in other areas to minimize or rehabilitate backcountry campsites as well as revegetate and restore old trails will be made. Field work will include the application, on an experimental basis, of various techniques. A systematic experimental design will be developed in order to test alternative methods. Finally, the priority list of areas needing such rehabilitation will be developed.

6. LENGTH OF TIME NEEDED: This study will be conducted over a three year period.

7. WHAT WILL HAPPEN IF PROJECT NOT UNDERTAKEN: If the study is not carried out, the Parks high elevation backcountry will continue to contain many examples of over-developed campsites and old trail scars running through areas of soft vegetation. These conditions create both an ecological and visual impact contrary to the goal of managing the backcountry in a natural state.

8. WHAT ARE THE ALTERNATIVES:

   a. No action.

   b. Fund the project at the desired level.

9. PERSONNEL: The study can best be conducted by Park personnel.

10. ADMINISTRATION AND LOGISTICS: Investigators must be highly mobile as the field work will be carried out throughout the Parks. The project will be coordinated by the Research Scientist.

FUNDING

	Year in Program Sequence				
	1st	2nd	3rd	4th	5th
Personal Services			$14,000	$14,000	$14,000
Other than Personal Services			$ 5,000	$ 5,000	$ 5,000
Grand Total			$19,000	$19,000	$19,000

Funds available in Park Base: None.

Funds requested from Regional Office: $19,000 for each of three years.

11. REFERENCES AND CONTACTS:

DeBenedetti, Steven, Biological Technician, Sequoia and Kings Canyon National Parks.

12. DATE OF SUBMISSION: June, 1981

NATURAL SCIENCE PROJECT STATEMENT

1. PARK AND REGION: Sequoia and Kings Canyon National Parks, Western Region

2. PROJECT NAME AND NUMBER: Effects of Fire on Fauna; N-19

3. STATEMENT OF PROBLEM: Little is known about the present distributions or densities of most vertebrates in these Parks. Prescribed burning and the restoration of natural fire cycles can be expected to effect the status of most species occurring within fire types, both directly and through changes in vegetation structure. Unless measurements are taken before extensive burning, there will be no way to evaluate what changes in faunation have been induced by fire.

4. WHAT HAS BEEN DONE: Limited, ad hoc small mammal trapping has been conducted in and near one chaparral burn site. Species lists have been compiled for the Parks, but information about the distribution of most species has been inferred from studies done elsewhere.

5. DESCRIPTION OF THE WORK TO BE UNDERTAKEN: Because data on species as diverse in their ecologies as reptiles, amphibians, birds, and mammals should be collected, many different type-specific techniques for censusing animals will be employed. Baseline-control and experimental plots will in many cases be the same as those used for vegetation studies. Trapping and marking will be used for some terrestrial species, while observation or acoustical detection will be used for others. The complex nature of the undertaking will require substantial baseline data on plants and abiotic resources.

6. LENGTH OF TIME NEEDED: The first phase of the study will be carried out over five years.

7. WHAT WILL HAPPEN IF PROJECT NOT UNDERTAKEN: If not undertaken, management actions of substantial and far-reaching consequences will take place with no measure of their effects on Park fauna.

8. WHAT ARE THE ALTERNATIVES: Studies conducted elsewhere could be used to infer expected changes in faunation, but such data are very limited. No action could be taken. Prescribed burning could be abandoned.

9. PERSONNEL: The study will be conducted both under contract and by Park researchers.

10. ADMINISTRATION AND LOGISTICS: Responsibility for the study will be shared by the Research Scientist and the Fish and Wildlife Specialist.

FUNDING

	Year in Program Sequence				
	1st	2nd	3rd	4th	5th
Personal Services		$4,000	$20,000	$20,000	$20,000
Other than Personal Services		$1,000	$ 5,000	$ 5,000	$ 5,000
Grand Total		$5,000	$25,000	$25,000	$25,000

Funds available in Park Base: None

Funds requested from Regional Office: $5,000 in FY-83, and $25,000 in FY-84.

11. REFERENCES AND CONTACTS:

a. Graber, David M. , Research Scientist, Sequoia and Kings Canyon National Parks, Three Rivers, CA. 93271

b. Werner, Harold, Fish and Wildlife Specialist, Sequoia and Kings Canyon National Parks, Three Rivers, CA. 93271

NATURAL SCIENCE PROJECT STATEMENT

1. PARK AND REGION: Sequoia and Kings Canyon National Parks; Western Region.

2. PROJECT NAME AND NUMBER: Establishment of Baseline Data to Evaluate Empacts of Management Programs and External Influences on Park Ecosystems; N-21.

3. STATEMENT OF PROBLEM: Effective management of the Parks' natural resources depends on adequate knowledge of the composition, distribution and functioning of both plant and animal communities. Without basic inventory data in a form that can be readily retrieved, it is virtually impossible either to monitor or predict the consequences and impacts of alternative management actions or external influences. These Parks span an elevational range of 13,000 feet. They contain a staggering variety of plant and animal species composing dozens of distinct biotic communities, each of which reacts in a unique way to management programs and such external influences as air pollution and visitor use. It is essential to understand the dynamics of park ecosystems if their survival is to be assured.

4. WHAT HAS BEEN DONE: A number of isolated studies have been conducted on species and communities of special concern. No systematic effort has been made to assure standardized data collection techniques or efficient data storage and retrieval. Most park ecosystems and species have not been studied at all.

5. DESCRIPTION OF THE WORK TO BE UNDERTAKEN: All existing data on the natural resources (plant and animal species and communities) will be collected and summarized. A systematic study plan will be developed for the collection of basic inventory data for all Park ecosystems. Standardized data collection methods will be selected in order to assure comparable information on species composition, structure, and function for all communities. Special attention will be given to assuring a data storage and retrieval format that will be utilizable by managers and scientists, and that will be compatible with resource inventories now being developed for other public lands.

6. LENGTH OF TIME NEEDED: The study will be carried out over a five year period.

7. WHAT WILL HAPPEN IF PROJECT NOT UNDERTAKEN: If not carried out, Park managers will be forced to make critical management decisions affecting the health and stability of park ecosystems without an understanding of the impacts. Research projects will continue to labor under inadequate baseline data. Such approach to park management threatens the survival of the very communities for which these Parks were created to preserve.

8. WHAT ARE THE ALTERNATIVES:

   a. No action.

   b. Fund the project at the desired level.

9. PERSONNEL: The study will be carried out in part by the Parks' personnel and in part under contract to qualified investigators.

10. ADMINISTRATION AND LOGISTICS: Investigators will need to work throughout these Parks. The project will be coordinated by the Research Scientist's office with significant input from the Resources Management Division.

    FUNDING

	Year in Program Sequence				
	1st	2nd	3rd	4th	5th
Personal Services		$24,000	$34,000	$34,000	$29,000
Other than Personal Services		$25,000	$15,000	$15,000	$20,000
Grand Total		$49,000	$49,000	$49,000	$49,000

    Funds available in Park Base: None

    Funds requested from Regional Office: $49,000 for each of five years.

11. REFERENCES AND CONTACTS

    a. Graber, David, Research Scientist, Sequoia and Kings Canyon National Parks.

    b. Parsons, David, Research Scientist, Sequoia and Kings Canyon National Parks.

12. DATE OF SUBMISSION: June, 1981

NATURAL SCIENCE PROJECT STATEMENT

1. PARK AND REGION: Sequoia and Kings Canyon National Parks; Western Region.

2. PROJECT NAME AND NUMBER: Reintroduce Bighorn Sheep, N-22.

3. STATEMENT OF PROBLEM: Bighorn sheep *(Ovis canadensis)* were once extant throughout the mountains of the western states, but now are reduced to remnant herds. In the Sierra Nevada the two surviving herds both include Sequoia and Kings Canyon National Parks within their summer ranges. They winter on the eastern slope, outside the Park. A large and well-known herd of bighorn occupied the Great Western Divide above Mineral King until the 1920's when it was eliminated by hunting. Reintroduction of sheep to this area would provide a chance to protect the species entirely within the confines of the National Parks, would further restore the Parks to pristine conditions, and provide an opportunity for the public to observe an exciting large mammal.

4. WHAT HAS BEEN DONE: A great deal of information exists about the two present herds. This was developed in part with N.P.S. funding. An initial winter overflight conducted by Park staff and Dr. John Wehausen showed promise of quality winter habitat within the Park and close to the Great Western Divide.

5. DESCRIPTION OF THE WORK TO BE UNDERTAKEN: Extensive surveys of potential summer and winter ranges would be conducted to assure that a reintroduction would be successful. Then, when sufficient numbers of sheep were present in the Baxter Herd, 20-30 individuals would be released on winter range after fitting some of them with radio collars. Food habits, movement and migration, natality and mortality would be studied intensively for three years. In particular, behavior of the herd in response to unknown terrain is of particular interest.

6. LENGTH OF TIME NEEDED: One year of preliminary work will be followed by three years of intensive study. Long-term monitoring would be done by Resources Management.

7. WHAT WILL HAPPEN IF PROJECT NOT UNDERTAKEN: Bighorn sheep will continue to occupy a fraction of their former range. An important fauna species will continue to be absent for most of its historic range in these Parks.

8. WHAT ARE THE ALTERNATIVES:

   a. No action.

   b. Fund the project at the desired level.

9. PERSONNEL: The study can best be conducted under the direction of the Research Scientist by seasonal technicians, in consultation with the Fish and Wildlife Biologist.

10. ADMINISTRATION AND LOGISTICS: The study will be conducted in Sequoia National Park under the joint administration of the Research Scientist, and the Fish and Wildlife Specialist. Capture and relocation of sheep will be performed in conjunction with the California Department of Fish and Game.

FUNDING

	Year in Program Sequence				
	1st	2nd	3rd	4th	5th
Personal Services			$15,000	$15,000	$15,000
Other than Personal Services			$20,000	$20,000	$20,000
Grand Total			$35,000	$35,000	$35,000

Funds Available: None

Funds requested from Regional Office: $35,000 for each of three years.

11. REFERENCES AND CONTACTS:

a. Graber, David, Research Scientist, Sequoia and Kings Canyon National Parks, Three Rivers, CA. 93271.

b. Weaver, Richard, California Department of Fish and Game, Sacramento.

c. Wehausen, John, P.O. Box 1143, Bishop, CA.

12. DATE OF SUBMISSION: June, 1981

NATURAL SCIENCE PROJECT STATEMENT

1. PARK AND REGION: Sequoia and Kings Canyon National Parks, Western Region.

2. PROJECT NAME AND NUMBER: Inventory of Rivers and Lakes; N-23

3. STATEMENT OF PROBLEM: Recent controversy over whether fish should be artificially planted in high sierran lakes, and evidence of possible acid rain in the sierra, call for information about the physical, chemical, and biotic attributes of the Parks' lakes and streams not now presently available.

4. WHAT HAS BEEN DONE: Extensive studies have been made of the actual and potential fishery resource of the 137 lakes stocked since 1965. Limited sampling of water quality has been conducted by the Division of Resources Management, and by independent scientists.

5. DESCRIPTION OF THE WORK TO BE UNDERTAKEN: Sampling, stratified by known independent variables such as elevation and human use, will be conducted at lakes and streams in the Parks to establish baseline physical and chemical properties. An inventory will be made of all exotic aquatic organisms to determine their identity, distribution, and abundance. Experiments will be conducted on a small number of lakes to measure and determine the effects on biota of removing all exotic fish.

6. LENGTH OF TIME NEEDED: The study will require three years.

7. WHAT WILL HAPPEN IF PROJECT NOT UNDERTAKEN: There will be no basis upon which to make fishery management decisions. Changes in the aquatic resources of the Parks may go undetected, possibly leading to resource degradation.

8. WHAT ARE THE ALTERNATIVES: No action taken.

9. PERSONNEL: The project will be conducted primarily through an outside contract.

10. ADMINISTRATION AND LOGISTICS: The project will fall under the joint supervision of the Research Scientist, and the Fish and Wildlife Specialist.

FUNDING

	Year in Program Sequence				
	1st	2nd	3rd	4th	5th
Personal Services			$ 6,000	$ 6,000	$ 6,000
Other than Personal Services			$ 4,000	$ 4,000	$ 4,000
Grand Total			$10,000	$10,000	$10,000

Funds available in the Park Base: None

Funds requested from Regional Office: $10,000 for each of three years.

11. REFERENCES AND CONTACTS:

a. Erman, Don, University of California, Dept. of Forestry and Resources Management, Berkeley, CA. 94720.

b. Werner, Harold, Sequoia and Kings Canyon National Parks Fish and Wildlife Specialist.

NATURAL SCIENCE PROJECT STATEMENT

1. PARK AND REGION: Sequoia and Kings Canyon National Parks, Western Region.

2. PROJECT NAME AND NUMBER: Effects of Acid Rain on Vegetation and Aquatic Ecosystems; N-25.

3. STATEMENT OF PROBLEM: External air pollutants such as sulphur dioxide and nitrogen oxides found in the air mass over Sequoia and Kings Canyon are threats to the health and potentially to the survival of many plant and animal species as well as aquatic ecosystems. The extreme sensitivity of some of these species and ecosystems was emphasized in the recent International Symposium on the Effects of Air Pollution on Mediterranean and Temperate Forest Ecosystems held in Riverside on June 22-27, 1980. It is known that air pollution is capable of killing trees directly as well as making them more vulnerable to drought, insects and disease. Acid precipitation is known to improvish soil and eventually sterilize lakes.

4. WHAT HAS BEEN DONE: While several acid rain monitoring stations have been established, no information is availalbe on the effects of different levels of acidity on plant or aquatic communities.

5. DESCRIPTION OF THE WORK TO BE UNDERTAKEN: A thorough literature review of the effects of acid precipitation on plants and aquatic systems will be made. Field studies will be designed to fill holes in existing findings to site specific studies in these Parks. This will require identification of high and low impact areas in terms of input of acid rain. Present acid precipitation monitoring work will be expanded so as to establish gradients of acid input. This information will then be used to design studies to evaluate the effects of different levels of acidity on plant communities and aquatic systems. Correlations will be developed wherever possible between acid input and measurable effects.

6. LENGTH OF TIME NEEDED: The study will be conducted over a minimum of three years.

7. WHAT WILL HAPPEN IF PROJECT NOT UNDERTAKEN: If this study is not conducted, survival and health of the Parks' vegetation and aquatic communities may be seriously threatened. The potential loss of biotic life forms in our Parks' ecosystems would seriously endanger the stability of surviving ecosystems.

8. WHAT ARE THE ALTERNATIVES:

   a. No action.

b. Assess the effects of acid rain at the level of funding indicated.

10. ADMINISTRATION AND LOGISTICS:

FUNDING

	Year in Program Sequence				
	1st	2nd	3rd	4th	5th
Personal Services					$12,000
Other than Personal Services					$24,000
Grand Total					$36,000

Funds available in Park Base: None

Funds requested from Regional Office: $36,000 for each of three years.

11. REFERENCES AND CONTACTS:

a. USDA Forest Service. 1980. Proceedings of Symposium on Effects of Air Pollutants in Mediterranean and Temperate Forest Ecosystems. General Technical Report. TSW-43.

12. DATE OF SUBMISSION: June, 1981.

NATURAL SCIENCE PROJECT STATEMENT

1. PARK AND REGION: Sequoia and Kings Canyon National Parks, Western Region.

2. PROJECT NAME AND NUMBER: Ecology of Exotic Plants; N-26.

3. STATEMENT OF PROBLEM: Exotic grasses and herbs, primarily of mediterranean origin, dominate the foothill grasslands and the understory vegetation of the oak woodland and mixed evergreen chaparral communities in the Parks. Exotic plants can also be found scattered through other Park communities. Exotic ornamentals present in residential areas possess the potential for escape, especially in combination with the reintroduction of fire to nearby slopes. It is the responsibility of the Parks to determine the feasibility of eliminating those exotics and establishing native vegetation in their place.

4. WHAT HAS BEEN DONE: No comprehensive inventory of exotic plant species exists and no studies have been conducted to determine the success or adaptation of exotic species to current management regimes.

5. DESCRIPTION OF WORK TO BE UNDERTAKEN: All plant communities of the Parks will be inventoried for the presence and importance of exotic species. A thorough literature review will be made to determine what is known about the ecology of those species. Experimental research will be conducted to determine the feasibility and most efficient techniques of eliminating introduced species and reestablishing native vegetation. This will include experimental prescribed burns of grassland and other herbaceous communities, physical removal of individual plants, and the potential for success using herbicides. Following completion of the experimental work a plan will be drawn up analyzing the feasibility of removing exotic species from various park plant communities.

6. LENGTH OF TIME NEEDED: The study will be conducted over a four year period.

7. WHAT WILL HAPPEN IF NOT UNDERTAKEN: Exotic species will continue to dominate many park plant communities. The possibilities of gradual or rapid expansion of exotic species in different areas of these Parks will be unknown. Park ecosystems will wontinue to not represent truly natural communities.

8. WHAT ARE THE ALTERNATIVES:

   a. No action.

   b. Conduct research at the level indicated.

9. PERSONNEL: The study will be carried out by the Park Research Scientist and technicians.

10. ADMINISTRATION AND LOGISTICS:

FUNDING

	Year in Program Sequence				
	1st	2nd	3rd	4th	5th
Personal Services					$22,000
Other than Personal Services					$ 6,000
Grand Total					$28,000

Funds available in Park Base: None

Funds requested from Regional Office: $28,000 for each of four years.

11. REFERENCES AND CONTACTS:

a. Parsons, David J., Research Scientist, Sequoia and Kings Canyon National Parks, Three Rivers, CA. 93271.

12. DATE OF SUBMISSION: June, 1981